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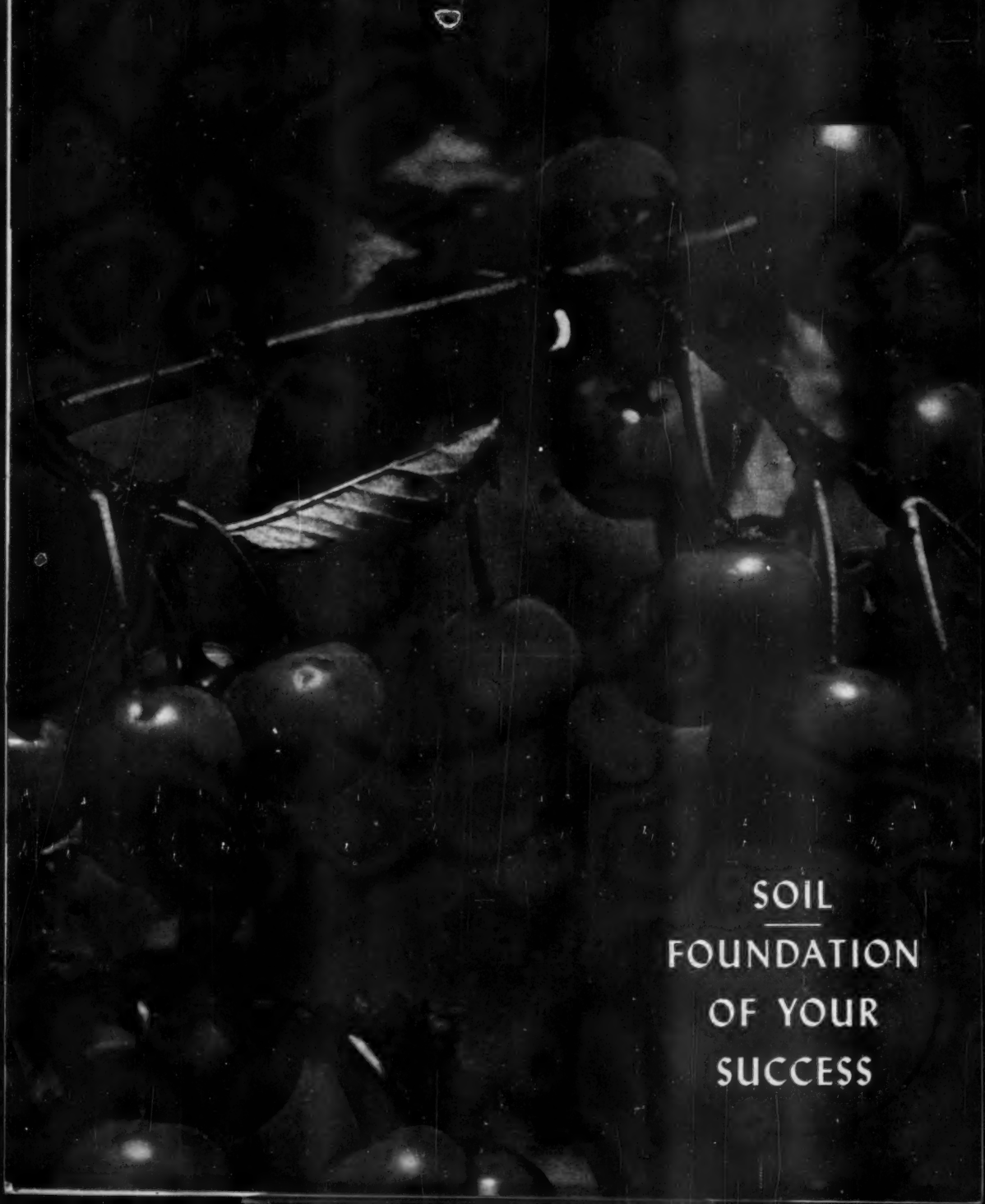

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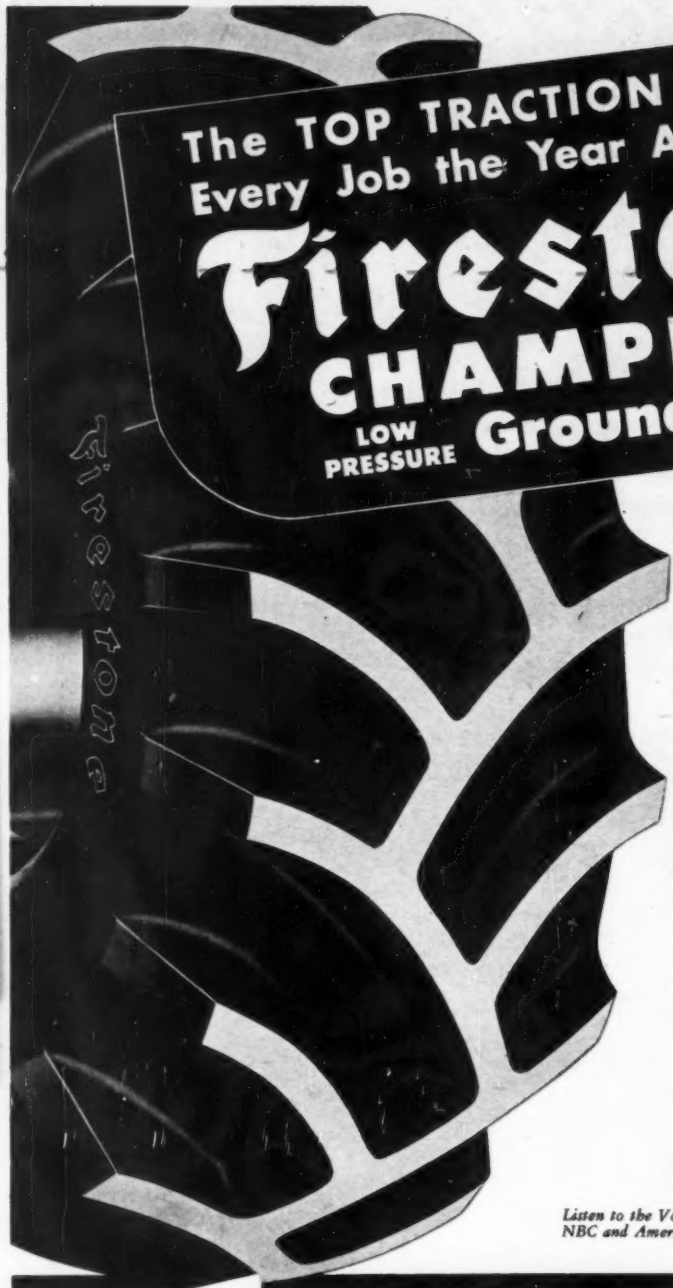

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3. USE ONLY 12 LBS. PRESSURE

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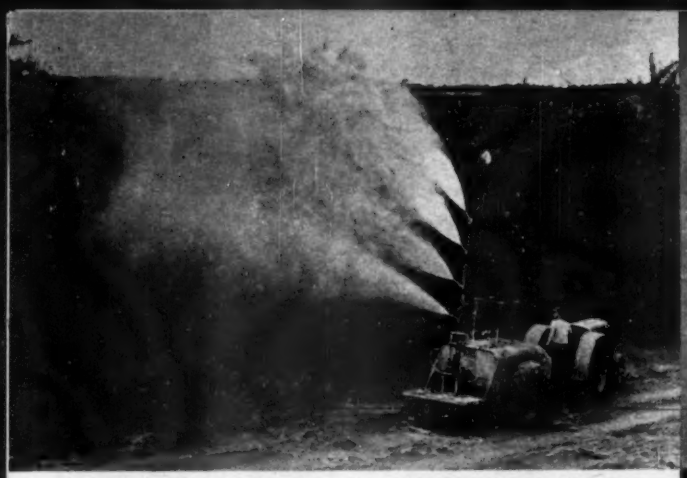

Automatic spraying means clean fruit, and Sour Orchards near Sparta, Michigan got complete crop protection with a 4-gun John Bean Automast in 1948. Automatic spraying means lower cost. One-man operation of the sprayer (by the tractor driver) saves labor cost. Faster application further reduces labor cost and protects all your orchard when you need it.

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Automasts are available in 4-gun (left) for one-man spraying; or 8-gun models, for two-man spraying. A 4-gun Automast can be quickly converted to the 8-gun model. A 4-gun Handimast and 8-gun LOW-BOY for peaches and cherries are also available.

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The drive mechanism for the Bean Automast operates from an extension of the tank agitator shaft. It is simple in design, sturdy, and will give years of trouble-free service.

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All controls of the Automast and of the sprayer are operated by the driver from the tractor seat.

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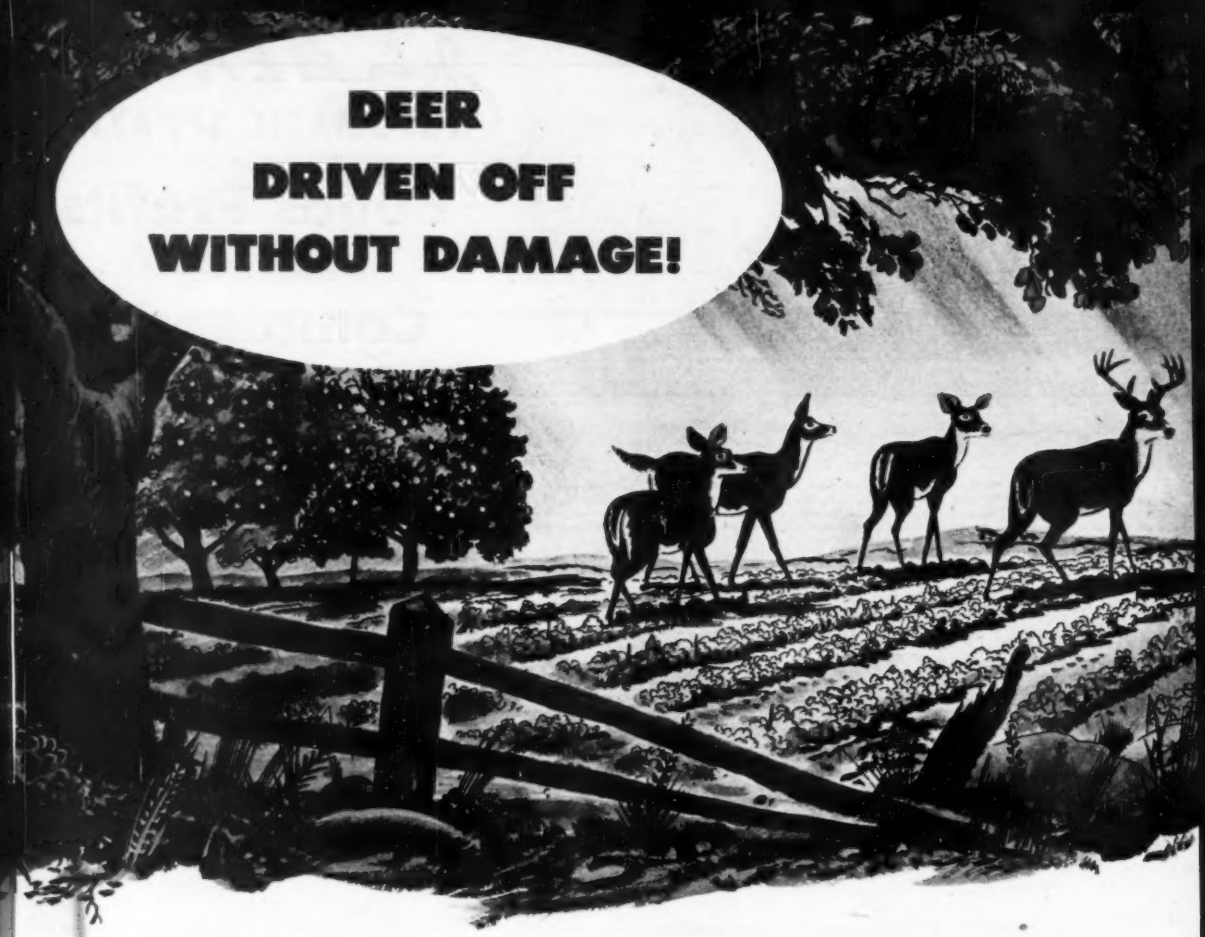

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Pittsburgh Agricultural Chemical Company is one of the few basic producers of this chemical. It is available in 25% dust concentrate and 15% wettable dust concentrate, chemically and biologically standardized. Full technical information about its characteristics and methods of application is available in bulletin No. 106. Ask for it, without any obligation.

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Results will amaze you—better flavor, more color, larger fruit. It will save you money and labor.

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APRIL 1949

VOL. 69 No. 4

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THIS MONTH'S COVER

Few question the supremacy of the Montmorency cherry which appears on our cover this month. The trees are vigorous and productive and are adaptable to a wide variety of soils. Statistics indicate that it is the most widely grown and consumed cherry in the United States.

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LETTERS TO THE EDITOR

Weather Factors Chart

Dear Sir:

I wish to congratulate you on your February issue which contained much valuable information for the commercial fruit grower as well as the experiment station worker.

Your chart on weather factors in spraying and dusting pome fruits is especially interesting. At present we are in the process of revising our publication of spray schedules for fruits, and I would like to inquire whether we might incorporate this chart with minor omissions. It seems to me that this information regarding weather factors is particularly important in Nebraska where high temperatures exist in much of our spraying season.

Lincoln, Nebr. Arden F. Sherf

Permission granted; and we are happy Mr. Sherf is able to make such good use of the chart on weather factors in spraying and dusting.—Ed.

Dear Sir:

Your February issue is one of the most timely and valuable I have ever seen. It will be most useful for growers.

I am posting the charts, covered over with cellophane, at the packing shed where I know we will be referring to them often this spring and summer.

Wakeman, Ohio C. H. English

We are having extra copies of the 1949 compatibility chart printed on heavy paper suitable for posting, and any of our readers may order them by writing to us and enclosing 10 cents to cover cost of mailing and postage.—Ed.

Steuben Grape

Dear Editor:

I read in your very excellent January issue on fruit varieties that the Steuben grape is immune to black rot. To me, a veteran grape grower, such a new variety would be a miracle.

This statement, however, is just too good to be true. I am tempted to get my axe and at once cut out all my defunct vines but will wait until you verify this statement by getting the writer to amplify.

New Haven, Mo. Guy Trail

Dr. George D. Oberle, author of the article in question, writes: "I certainly did not mean to infer that the Steuben grape is totally immune to black rot. My statement, 'The vine has never been subject to attack by downy mildew or black rot,' was based on observations including 10 vines at Geneva, N. Y., that had received rather haphazard spraying; 25 vines in Yates County, New York, receiving no sprays; 20 vines in Chautauqua County, New York, that received very thorough spraying; and 50 vines in Niagara County, New York, that received adequate spraying. Of this material I saw, over a period of nearly 10 years, two berries that may have been infected by black rot. These were in the vineyard in Yates County that had received no spraying. The Steuben vines were adjacent to vines of Niagara that were completely riddled by black rot. On the basis of these observations, I believe that I am justified in stating that the vines have not been subject to attack by black rot or downy mildew. However, I do not intend to make the unwarrantable assumption that they are 'totally immune' to this disease.

"We have young vines of Steuben in our testing vineyard at Blacksburg. They have not yet fruited and we are making no claims for their performance here until we have had more opportunity for observation. I may add that in all of the vineyards in New York in which Steuben was tested, ample opportunities for infection by black rot and downy mildew existed. Other varieties growing in these vineyards lost much of their crop from these diseases. In no case, however, did the Steuben suffer attack by either disease."—Ed.

Stem Lice

Dear Editor:

I have conducted a small fruit orchard for a considerable number of years, in southern Iowa, and have been reasonably successful with the exception of plums—the variety known locally as Red Wing. This plum, every year, becomes totally destroyed by its enemy, the curculio, unless thoroughly sprayed as often as it makes its appearance. During the last season, however, a worse enemy than curculio made its appearance just before the ripening season.

With the trees loaded with fine large ripening fruit—2 to 2½ inches—I discovered that the stems of the plums were totally covered with hundreds of stem lice, so called for want of a better name. In a few days these lice ate the skin around the steam causing them to drop off shortly before maturity.

I am exceedingly anxious to find a spray that will destroy stem lice. Will some fruit grower who has had experience with stem lice on plums kindly mail me the formula.

Kent, Iowa L. C. Bowers

Facelift for Tractors

Dear Sir:

In the pictures of equipment shown in action in your valuable magazine I notice one thing that puzzles me. How do the owners of these great sprayers manage to keep them so clean? What becomes of the residue of previous operations after it has floated in and about every crevice and aperture of engine, ignition, and radiator? Bordeaux followed a few days later by lime-sulfur leaves a stone-hard encrustation which no water will remove.

Sir, if there is some nostrum or simple syrup that will remove these vile accretions without undue physical exertion, I would like to know of it. I would like to give my tractor a painless facelift. No wire-brushing, please.

Brighton, Ont. G. E. Faulkner

A 37 per cent solution of muriatic acid diluted 10 times and applied with an old paint brush will do the trick. But be sure to wash off thoroughly in 15 or 20 minutes since this solution will attack and corrode metal. Better yet, do as one spray manufacturer suggests: before spraying, coat outer surfaces with a high pressure chassis grease which will wash off easily and carry away spray residues.—Ed.

Apple Juice Scores a Hit

Dear Sir:

The apple juice that you so kindly sent me came today. I was very eager to try it and drank 1½ tumblers without any harmful effects. Many thanks! I am sure this brand of apple juice will become very popular.

St. Paul, Minn. Carl Weschcke

Reader Weschcke is referring to the apple juice we sent him in response to his statement that he could not buy good apple juice. We thought he would like the juice we sent. At the same time, we have had our eyes opened to another fine juice—Apple Key Brand—produced by the Elberta Packing Co., Elberta, Mich. Thanks to Reader Cohodas for sending us a sample; it rates among the leaders on our list.—Ed.

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Dobbins *new* all-purpose power sprayers are the finest built . . . scientifically designed to do the *best* job at the *lowest* cost. Each unit is the product of careful research . . . sturdy, dependable. Each embodies many superior features to help you raise large, luscious fruit, and add to your profits. Three of many popular models are shown below.

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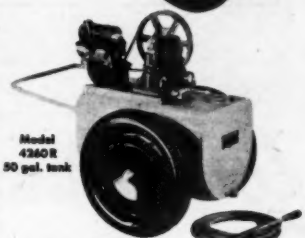
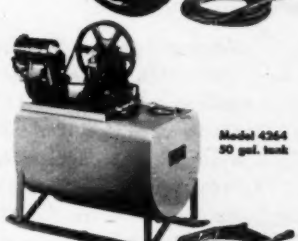


Model 4260R 50 gal. tank



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You'll like the ease of handling and maneuverability in tight spots that is yours with an International Crawler. You'll be surprised and pleased with the low fuel and maintenance costs that have made Internationals a byword for economy. In every way, International Crawlers are built to outperform.

Stop in and see your International Harvester Dealer soon. Ask him for the details about International Crawler tractors. Feature by feature, there isn't a better buy anywhere for cultivation power.

Remember, your IH Dealer is your single source for both power and equipment, and his service facilities are unexcelled. You'll find he's a valuable man to know.

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Fifteen-year-old highbush blueberries growing under mulch on upland soil. At right—Sparkle strawberry.

SMALL FRUIT PROGRAM IN NEW JERSEY

By FRANKLIN A. GILBERT

New Jersey Agricultural Experiment Station

A BREEDING program for the development of better late varieties of strawberries was started at the New Jersey Experiment Station in 1928. Although the first phase of this program was primarily for the breeding of late varieties, it has since been expanded to include several other objectives, such as breeding for red stele resistance, for improvement of varieties throughout the strawberry season, for earlier maturing varieties, for varieties better adapted to quick freezing, and for making selections for plant vigor, runner production, size and shape of fruit, appearance of calyx, and quality, and for many other factors involved in any breeding program.

The first strawberry to be introduced by the New Jersey Station was N. J. 35, subsequently given the name "Pathfinder." It has been a desirable variety because of its early ripening, abundant fruits of somewhat light and attractive color, and its resistance to the red stele root disease. At present it is in some disfavor in New Jersey as the berries are considered by many growers to be too soft for commercial shipment. In New England the berry is firmer and is still extensively planted because it is a reliable cropper.

Julymorn (N. J. 225) was distributed by the New Jersey Small Fruits Industry Committee in 1938. It was introduced as a late fruiting variety and proved to freeze well where the dark red frozen product is desired. It has not been widely planted as the first fruits tend to be a little corrugated and the plants need a fertile soil with an abundant supply of moisture. Also, it is not resistant to red stele. Test plots at various experiment stations indicate that it does better from New Jersey north.

Crimson Glow (N. J. 311), introduced in 1940, is probably the least planted of the New Jersey introductions as the fruit tends to get dark and to be somewhat soft. When introduced, it was suggested as of merit for the home garden.

Redwing (N. J. 347), introduced in 1940, is becoming more popular in New Jersey because of its attractive, large, well-colored fruits plus the fact that it continually has been the best freezing berry tested at the New Jersey Station. Field tests show it has been partially resistant to red stele. During the last two or three years, a New Jersey nursery has indicated that more and more New Jersey growers are purchasing this variety.

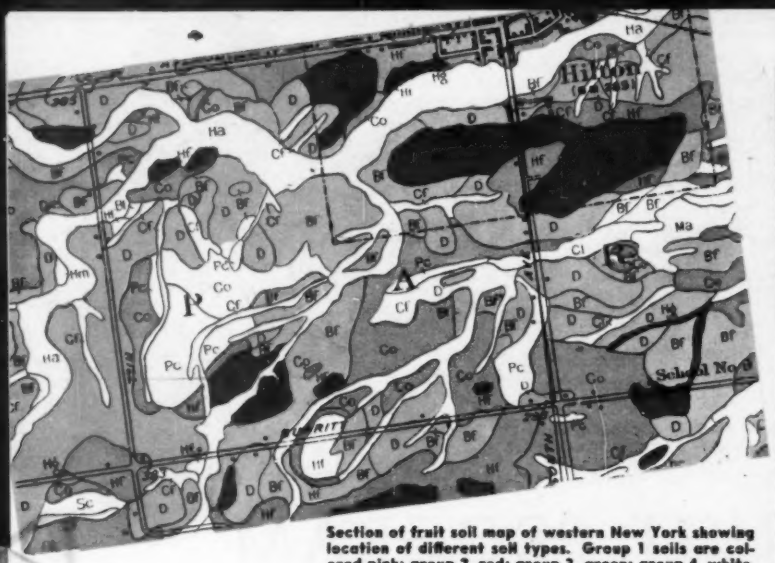
Sparkle (N. J. 312), introduced in 1942, is the most widely planted new introduction in New Jersey and is being planted extensively in other States. The fruits are medium in size, roundish conic, and a bright glossy red with a bright green calyx. The flesh is firm and of good quality. It is another variety which makes a very good quick-frozen product. The plants are prolific, producing a large number of runners. This variety has proven to be highly resistant, under field conditions, to the red stele root disease.

Strawberry selections under second test.

Miss Elizabeth White and Dr. G. M. Darrow observing unnamed blueberry selection.

Redcrop (N. J. 377) is the latest variety introduced by the New Jersey Station and was released by the New Jersey Small Fruits Industry Committee during the spring of 1948. It ripens three to four days after Pathfinder, and is a much firmer berry with greater resistance to rot than Pathfinder.

(*Continued on page* 30)



Section of fruit soil map of western New York showing location of different soil types. Group 1 soils are colored pink; group 2, red; group 3, green; group 4, white.

TAKING THE GUESSWORK OUT OF FRUIT SOILS

By RALPH G. PALMER

EARLY SETTLERS in western New York soon learned through bitter and costly experience that fruit trees in some locations grow poorly, considerable numbers of the trees die prematurely, and yields are disappointing. Extensive studies by soil, fruit, and agricultural economics research workers have made available a great amount of information bearing on the problem of evaluating orchard sites and soils. This article proposes to explain the use of this information in estimating the value of soils in Monroe County, located in a favorable climatic environment, for the purpose of growing fruit.

From the information assembled by these workers it is possible to group the more than one hundred soils found in this area in four categories based upon their suitability for fruit.

Four Soil Categories

Group 1. Good to excellent fruit soils. These soils are open textured, have excellent internal drainage, and because of these characteristics permit relatively free circulation of air for some distance below the surface. Some of the soils in this group have faintly defined compact layers well below the surface, but these layers are not sufficiently dense to offer appreciable resistance to movement of water and soil air, nor do they interfere with fruit tree root penetration which may reach a depth of 10 to 15 feet or more. All the fruit trees in the area—sweet and sour cherries, peaches, apples, pears, and prunes—grow well, are long lived, and produce abundantly on most of these soils.

Group 2. Fair to good fruit soils. Soils in this group have slightly impeded internal drainage or moderately compact subsoils, characteristics which tend to somewhat restrict depth of rooting of fruit trees. The performance of sweet cherries and peaches on these soils is inferior to that on the good to excellent fruit soils to such an extent that it is generally inadvisable to plant these fruits on the fair to good fruit soils. Sour cherries do moderately well on the better soils in this group, particularly when grown on mazzard rootstocks. Apples, pears, and prunes grow and yield nearly as well as on the best fruit soils; at least the differences in growth and yield between apples, pears, and prunes growing on these soils and on the good to excellent soils are less striking than those of sweet cherries, peaches, and even sour cherries.

Group 3. Poor to fair fruit soils. In this group are relatively shallow soils with slow internal drainage and restricted aeration. The compact subsoil layers are marked and near the surface and definitely restrict root growth largely to the shallow surface

RELATION OF AGE TO YIELD OF TREES ON DIFFERENT SOILS

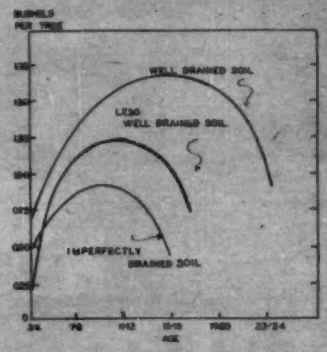
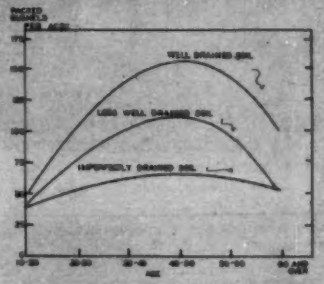
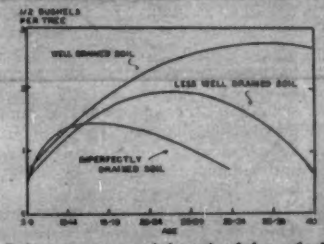


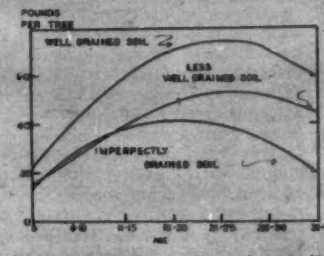
Chart shows that soils unadapted to peaches do not limit production on young trees to same extent as on older trees.



Substantial differences in yields on different soils do not occur in the case of apples until the trees are 25 to 30 years old.



Prunes are more tolerant of imperfect soil drainage and may return some profit on such soils under expert management.



As sour cherry trees approach maturity yields on well drained soils increase rapidly; are much greater than on other soils.

Apple trees have eked out a meager existence for many years on this imperfectly drained site.

soil. Some of the poorer soils in this group are occasionally saturated with water in the spring or after heavy rains. Sweet and sour cherries and peaches fail to grow and produce commercial crops on these soils. Certain varieties of apples which are more tolerant to poor internal drainage, such as Twenty Ounce, McIntosh, Rhode Island Greening, and Rome Beauty, do fairly well on the better soils in this group but only *under expert management*. Pears and prunes also perform fairly well on the better soils in this group *when properly handled*.

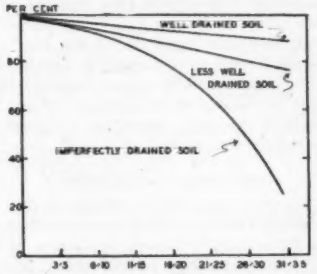
Group 4. Very poor to poor fruit soils. In this group are shallow soils with poor internal drainage and aeration and a well defined, practically watertight layer or hardpan close to the surface. Many of these soils are flooded or waterlogged for considerable periods in the spring or following heavy rains. Fruit tree root growth is severely restricted, usually to the top foot of the soil. These soils are not adapted to growing fruit. Even the apple varieties relatively tolerant to poor drainage do not produce good commercial crops. Most orchards planted on the soils of this group are neglected and abandoned when it becomes apparent that they will not return a profit.

Soil Groups Are Mapped

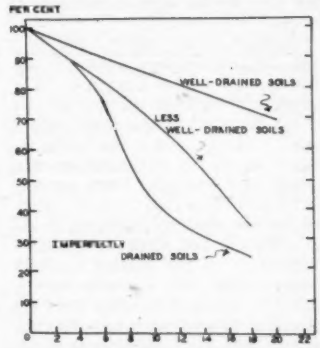
Different colors were assigned these soil groups by research workers and a large scale soil map of the county was made showing the individual soils, soil boundaries and symbols, and the fruit soil group to which they belong. This map was made up in overlapping sections and mounted in transparent pocket looseleaf notebooks.

In addition, tabular and illustrative reference material was assembled and placed in a similar notebook. This fruit soil map and fruit information fill a half dozen notebooks, which are kept in a large leather catalog case for easy and safe transportation and use in the field.

PER CENT OF ORIGINAL TREES REMAINING AT GIVEN AGES ON DIFFERENT SOILS



Curves show per cent of original sour cherry trees planted still living at ages given along bottom line. Note heavy mortality in older orchards on imperfectly drained soils.



During first five to eight years rate of peach tree loss is much the same on all soils. Major portion of original trees on imperfectly drained soils die soon after middle age.

Included in the reference material are tables and graphs from the actual records of the fruit soil studies showing the effect of soils on the mortality or length of life, also yield, of apples, sour cherries, peaches, pears, and prunes. A number of these charts are included with this article.

Effect of Soil on Tree and Yield

The effect of soils on fruit tree length of life or mortality is well illustrated in the accompanying sour cherry and peach charts. It will be noted that during the early life of these trees the mortality rate is nearly the same for all except the very poor soil groups. As the trees approach middle age, the rate of mortality on the poorer fruit soils increases faster than on the better drained soils. During the latter part of the life of the trees the mortality on the poorly drained soils eliminates a considerable portion of the original trees. This is typical in varying degrees with the other fruits grown in the area.

Yields are also affected by soils, as is shown in accompanying graphs. Here again the trees on all fruit soil groups perform about alike during the early life of the trees. As the trees become older the yields of the trees on the better drained soils increase much more rapidly than those of the trees on the poorer soils, until by the time the trees are middle aged there is a very striking difference in yield between orchards growing on the best and those growing on the poorer drained soils. When the rainfall for a series of years is well below normal, fruit trees on some of the deep, well-drained soils, particularly those with the coarser soil particles, may suffer considerably from drought. An excessive rainfall for several seasons may temporarily upset the soil values outlined above by making some of the moderately drained soils too wet for good fruit tree growth and fruit production.

This tendency for fruit trees to grow and yield fairly well on the first three fruit soil groups during their early life, and the temporary effect of wet and dry periods, is frequently confusing to persons not well acquainted with the history of fruit soil relationships and sometimes leads inexperienced fruit growers to suspect that the importance of soil has been overrated or misjudged.

Soil Evaluation a "Must"

Since soil has a constant and inescapable effect on the growth, mortality, and yield of fruit trees, and since there is little that can be done to change this influence, careful evaluation of the underlying soil is a most important factor in all phases of the

(*Continued on page* 36)

HOW TO MANAGE ORCHARD SOILS

By R. E. STEPHENSON
Oregon State College

Every fruit grower should know the basic soil principles outlined in this story. He will get a new understanding of tree-soil relations.

SOIL is a major factor in successful fruit growing. The plant establishes itself with the soil through its root system, and the root system has an important job to perform.

A vigorous, healthy plant capable of setting and maturing a heavy harvest must have roots able to penetrate without hindrance, sometimes 10 to 15 feet, into the soil. Roots must be able to branch and send out feeders of fine roots profusely covered with root hairs and to make intimate contact with soil surfaces in order to withdraw those elements and the moisture necessary for good growth.

Root Activity

It has been estimated that the annual dry weight of growth in an orchard in full bearing, including wood, leaves, and fruit, is six tons per acre. To produce this growth some 200 pounds of nitrogen, in addition to a considerable portion of phosphorus, potassium, sulfur, calcium, iron, magnesium, copper, zinc, manganese, and boron, must be withdrawn from the soil through the root system.

These nutrient elements must be taken into the root system in combination. For example, if nitrogen were taken into the plant in the form of potassium nitrate, as part of it may be, some 1400 pounds an acre would have to pass into the root system to supply the 200 pounds of nitrogen.

Or considering only the ash of the six tons of annual growth there would be perhaps 600 pounds or more an acre which represents minerals taken from the soil. To gather all these nutrients through surface contacts between roots and soil is no small accomplishment.

The withdrawal of moisture is a bigger job yet. Using the average figure of 500 tons of water to make one ton of dry plant material, the six tons would require six million pounds (720,000 gals.) of water which roots must withdraw from an acre of soil, and this from a soil with moisture present only as a thin film on soil surfaces or in capillary spaces so small as to be invisible. Even if only one-half this amount of water were needed, the task is still huge.

Perhaps these statements may indicate the importance of having a good soil, well-supplied with nutrients, capable of retaining much moisture, and yet porous and permeable enough to provide good drainage and aeration, and to permit profuse development of feeding roots.

Extent of Root System

Plants have more roots than most of us are aware of. A scientist who made a study of root systems reports a single rye plant grown in the open which developed a total root length of 380 miles, including all branches and root hairs. The surface contact with the soil by such a root system was estimated at 7000 square feet, equal to a city lot of ordinary size. The roots, including root hairs, had many times as much surface as the leaf system.

A large fruit tree in good soil must have an extensive root system, though perhaps not proportionately as great as the rye plant.

Importance of Nitrogen

In fruit production nitrogen is the nutrient element of first consideration in most soils, although deficiency of all elements must be corrected for good production. Nitrogen is the growth element and pretty much determines the size of leaves and their chlorophyll content and, therefore, their capacity for manufacturing food for growth and fruiting.

Fruiting is best when there is a good balance between nitrogen and carbohydrate within the plant. The nitrogen comes from the soil and the carbohydrate is manufactured by the leaves. The grower controls the nitrogen supply by his fertilizer and management practices. Only partially can he control carbohydrate manufacture by his planting distances, pruning methods, and fertilizer practices which influence the number and size of leaves and their exposure to the sun. For instance, crowded trees are unfruitful where branches overlap, and tree thinning sometimes becomes necessary in old orchards for good production.

Too much nitrogen in the fertilizer program may stimulate so much vegetative growth that the carbohydrate supply is exhausted which is unfavorable to fruitfulness. Also an excess of carbohydrate resulting from insufficient growth because of too little nitrogen is unfavorable to fruitfulness. The intermediate condition with enough growth for good vigor but which does not exhaust the carbohydrate is most favorable to a good harvest of high quality fruit.

Nitrogen deficiency is most common, but other deficiencies may include phosphorus, sulfur, potassium, and sometimes boron, depending upon the soil and the crop. It is important to know the deficiency in terms of the crop produced.

In western Oregon boron deficiency is common for walnuts and sometimes so severe that practically no crop is set until borax is used to correct the deficiency. In the same area, however, boron deficiency for filberts has never been found. Thus, borax application is frequently compulsory to obtain a walnut harvest but is a waste of money and might prove injurious for filberts.

Most fruit plants are not very sensitive to soil acidity, and liming to correct any but extremely acid soils is not likely to improve fruit production. Cover crops grown for humus renewal may be in need of liming and, if so, the fruit may benefit indirectly from the increased humus renewal by the cover crop. Liming a severely acid soil does improve the general fertility for many farm crops.

The Role of Humus

Most fruit crops are rather sensitive to lack of humus renewal in the soil. Almost without exception, therefore, cover cropping and other humus renewal practices must be adopted for good fruit production.

In the greenhouse strawberries grown without fertilizer produced starved plants that set few berries and made only two harvests. Use of N-P-K-S resulted in four harvests and a fourfold yield increase. When compost was added to the above treatment, the yield was nearly doubled again. The fertilizer and compost produced more than twice the yield of fertilizer alone, indicating that both organic matter and fertilizers were needed for best results with strawberries on this soil, which was a Willamette silt loam.

(*Continued on page* 34)

THE SIMPLE LIFE FOR THE APPLE TREE

By E. STUART HUBBARD

Many of our readers, beset by the complex problems of modern science and society, crave, as Mr. Hubbard does, for a return to "the simple life" both in the orchard and in human living. Whether this is only a vain hope or is really something that can be attained is the question. At least it is a matter now being freely discussed and, as such, merits consideration. Mr. Hubbard is former president of the New York State Horticultural Society and is a successful and prominent orchardist at Poughkeepsie, N. Y.

AS I LOOK BACK over 50 years of orchard experience, many pictures come to me. I see, some 40 years ago, a tree growing in a pasture on a loamy terrace between two rocky ledges, weighted with large, red apples. The foliage is rich, luxuriant, and healthy. The fruit is untouched by spray or dust. Now and then a bronzed scab scar or a curculio bump mars an apple, but the beauty, fragrance, and richness of the fruit compel forgiveness. This is a McIntosh.

Ten years later, rising above the city of Fitchburg in Massachusetts, on the boulder-strewn, wooded hillside, stretch rows of apple trees bending with fruit. Rich in color, leathery in texture, the leaves seem alive with health, vigor, and perfection, in striking contrast to the clean-tilled orchards of the Hudson Valley. These are the trees that bore the apples that were to make Marshall's McIntosh famous.

Still later, near the headwaters of the Hudson, covering a rolling plateau, stretches a dream orchard. The deep, silty soil, fertile with the residue of dairy barns and manured melons of former years, is covered with a cushion of sod. Again, the trees seem happy in their healthy, not too growthy, foliage. The fruits promise to be McIntosh worthy of Bullard's Farms.

Again, I see long rows of deep green trees which, but a few years back, had been bronzed with mites—the leaves small, thin, and spotted with scab. Beneath the trees is a carpet of mulch which nearly smothers the grass. The crop from these trees will be the large, firm, red McIntosh which Donnell's Orchards of Mexico, N.Y., will produce each year.

With these memories comes the knowledge that the McIntosh tree is hardy, vigorous, reliable in annual bearing, uniform in size of fruit, heavy in yield, a producer of few culls, adaptable to a wide variety of soils. To be sure, our young orchards, even when located on elevations with good air drainage, require several scab sprays. Otherwise, they are free from the troubles of many other varieties.

The trees which established this enviable reputation for the McIntosh variety grew in soils rich in the fertility of the forest, the upland pasture, or the manured dairy crop land. Where this fertility was maintained by the use of mulch or manure, these characteristics have persisted. Where the living things natural to an organic soil continue undisturbed, the trees still produce McIntosh apples. They live the simple life.

But early in the century times changed. The dairy herd was sold. There was no manure. It was said that plowing and tilling the ground would release nitrogen from the soil and prevent mouse damage. But tillage brought erosion. Color failed to develop. The remedy seemed to be sod

(*Continued on page* 40)

HELICOPTER DUSTING

By A. B. BURRELL, *Cornell University*

IN THE spring of 1948, a group of apple growers in the Champlain Valley of New York guaranteed a volume of business sufficient to assure the presence of a helicopter in the area for custom dusting against apple scab. It was an experimental proposition on both sides. All applications were made or supervised by W. A. Newton of Underhill, Vt., with 1948 Bell helicopters equipped and licensed for use with sulfur.

Conditions were moderately favorable for the development of apple scab, the spring being rainy and no pronounced drought developing before harvest.

Micronized sulfur dust or its equivalent was used. For better adherence, most applications were made on foliage wet with dew or rain, although some were applied during light drizzle. An effort was made to have coverage before or during the early part of each infection period.

To supplement observations on custom-dusted orchards, a five-acre area in the middle of a 100-acre McIntosh orchard was cared for exclusively by the helicopter throughout the primary infection period. Five sulfur dusts and three composed of 5 per cent DDT and 80 per cent sulfur were applied between May 10 and June 18, after which the helicopter had to fulfill a contract on potatoes in Maine. On the 17-year-old McIntosh trees in the experimental area, one pound of dust per tree or 65 pounds per acre was the usual dosage. On straight-away work, 30 acres per hour was a typical coverage rate.

The coverage of trees by helicopter was more uniform than is obtainable with ordinary flexible-tube ground dusters, especially in the tops. Underleaf coverage was light, but fairly good. The swirl imparted by the curved dust outlet aided in this respect. It seemed possible to get coverage with about one-fourth less dust than with the usual ground duster. The speed, height, and position of flying varied with the size of trees and with the weather.

In the five-acre experimental plot the control of scab with these frequent, carefully timed sulfur dusts was so nearly perfect that practically no spots were present on leaves or fruits to permit secondary infection. Hence, there was no spread of infection even where no fungicide was applied after the helicopter left.

The advantages of avoiding the mud and of quick coverage when dusting with helicopters are obvious. Limitations of the method include inability to fly in rough weather, or at night, and the inevitable desire of several growers to have the machine at the same time when an unexpected wetting period develops. Amos Avery and Donald Green, growers at Peru, N. Y., efficiently scheduled all custom work.

At top—Close-up showing dust hopper and curved dust nozzle of the helicopter which aids in under-leaf coverage. Above—Helicopter and service truck used by ground crew. Pilots W. A. Newton and A. Averill are pictured with their "flying platform."

In the experimental plot, the total cost of eight applications was $56.00 per acre; or the average cost was $7.00 per treatment per acre when application was figured at $2.50 per acre, sulfur dust at six cents a pound, and DDT-sulfur dust at nine and one-half cents a pound. The total cost (materials and application) of efficient spraying from the ground was about two-thirds the cost of the helicopter applications. Dusting from the ground was cheaper than from the helicopter, but coverage was not as good. Especially for insect control other applications had to be made before and after the ones listed, so the figures given are for the limited period, not for the whole season.

Helicopter dusting involves certain hazards. For example, one fruit grower carrying a bag of dust to the helicopter was killed when he walked into the rear rotor. A guard over this rotor and a roped-off area for landing and servicing the machine with only the helicopter crew permitted in the area would prevent such accidents. Rope and standards could be carried from orchard to orchard by the highly essential ground crew when custom dusting is done. On one occasion the engine stalled, resulting in a forced landing and damage to the helicopter. Dusting from the air is hazardous.

The costs of helicopter operation are high and the future of helicopter dusting for scab depends, in part, on whether a mutually satisfactory charge for the service can be worked out by operators and growers. Long rows and large blocks are essential for economical operation, even with this maneuverable machine.

Experiments in controlling orchard insects by helicopter should precede the commercial use of the machine for this purpose. Insect populations were too small in our experiments to provide good information.

Here are three types of consumer packages.

The "School-Boy" Winesap display shows how Washington State is endeavoring to dispose of small size apples by prepackaging. Closeup of package shown below.

WILL PREPACKAGING INCREASE APPLE SALES?

Results of Tests Being Conducted Bear Close Watching by Producers

By DONALD R. STOKES

A CONSIDERABLE segment of the fruit industry believes that prepackaging will increase the salability of apples and thereby help to offset the decline in consumption of this important fruit.

Other fruits and vegetables are being prepackaged on a growing scale. There is a feeling in some parts of the apple trade that their product, colorful and appealing when well packaged, might compete on better terms in the field of prepackaged products.

Most apple growers realize that the annual per capita consumption of fresh apples has decreased from over 45 pounds to less than 25 pounds during the last 25 years. A part of this decline may be due to the competition of other fruits and other kinds of foods. As people begin to eat more of one commodity, they usually eat less of some other. Consumption of green and leafy vegetables has increased materially.

Apples are one of the few commodities that, relatively, have lost favor with many consumers. Advertising alone cannot do the job of restoring them to full favor. More merchandising effort needs to be made.

One question that is now attracting much interest is: Will prepackaging become an effective device to improve the merchandising of fresh apples?

What does prepackaging have to offer? What do its proponents say?

First, they say this method makes it more convenient for a housewife to buy a particular unit of apples in the store. Studies have shown that housewives are particularly inclined to favor merchandising methods which save them time or give them added convenience. Many a housewife is more inclined to pick up an attractive, sanitary, five-pound transparent bag of apples than to stand around the produce counter waiting for the clerk to find time to select and weigh her purchase. This extra convenience of making apples immediately self-service to the housewife is indisputably a factor making for an affirmative answer to the question, "Does prepackaging increase the sales of apples?"

Second, prepackaging can help maintain the crisp condition of the apples. Bulk apples on retailers' shelves often become shriveled, wrinkled, or mushy awaiting sale to consumers while, on the other hand, apples prepackaged in moisture-proof transparent films retain for a longer time their solid, fresh appearance as well as crispness and juiciness.

Crispness of the apple is one of the most important characteristics sought by the average consumer. Soggy, soft, unappetizing apples, which many consumers have unknowingly purchased, undoubtedly have been a factor in reducing the per capita consumption of this important commodity.

To effect a greater preference for apples, every effort must be made to get a higher quality apple into the hands of the consumer. Prepackaging may help to do this job.

(*Continued on page 32*)

Donald R. Stokes is Agricultural Economist in the Marketing Research Branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington, D. C.

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Research workers and commercial growers acclaim this *patented* formulation as an outstanding contribution for the control of scab and other plant diseases.

PURATIZED AGRICULTURAL SPRAY doubly safeguards your trees. It offers fast, effective protection *before* infection occurs and acts to eradicate infections *after* they start.

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- Can be applied with common insecticides and fungicides
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STATE NEWS

• Frost Again Hits South Carolina Peaches

• West Virginia Apple Tax Held Invalid

SOUTH CAROLINA—Their peach orchards having survived the two cold spells on January 29 and March 1, after the unusually high temperatures in January, growers were hopeful that further freezes would not lower the estimated production of 6,500,000 bushels.

But their hopes were shattered on March 16 when temperatures of 20° to 24° killed sufficient bloom to reduce the estimated crop by perhaps more than 50 per cent.

Last year on March 29 when shucks were splitting a 28° cold reduced the crop to 3¼ million bushels.

Hardest hit in the March 16 freeze was the Spartanburg area where two-thirds of the State's peach production was expected.

A fair amount of buds escaped the cold attack, according to Extension Horticulturist Roy J. Ferree, and the main hope for a crop now rests on these unopened buds.

The season in the Spartanburg area this year is about five days ahead of the Sandhill and Ridge sections of South Carolina, which are south of Spartanburg. Normally, these areas are five days ahead of Spartanburg. The Spartanburg area may also harvest ahead of Georgia's Fort Valley area.

GEORGIA—Temperatures on March 16 in the middle Georgia peach section ranged from 20.5° to 23°, killing the more advanced flowers. Counts made show a variation from 37 to 60 per cent of the blossoms alive, depending on the location of the orchard and the stage of flower advancement. This should be sufficient for a fair crop. Around Manchester and Woodbury even a higher percentage of the blossoms are alive since they were held back even more than by insufficient hours of cold.

The temperature at Fort Valley on March 16 was 27° and some damage occurred. Due to insufficient hours of cold below 45° F. in the south Georgia peach section blooming is not as far advanced as in the other sections of the State. Not having quite enough hours of cold this year was a real blessing. The Elberta variety is blooming so slowly and sporadically that there is some doubt if there will be much of a set.

Some growers around Fort Valley are using DN sprays to break the rest neriod on such varieties as Erly-Red-Fre, Dixired, and Elberta, but it is still too early to tell whether it will be commercially practicable.—*E. F. Savage, Georgia Exp. Sta., Experiment.*

FLORIDA—If fully utilized, Florida citrus is "one up on the packing house pig", according to Fred Lawrence, citriculturist with the Florida Agricultural Extension Service. Not long ago Mr. Lawrence listed the products that are made or can be made from citrus and when he finished his compilation he announced that the whole fruit can be used and that, "unlike the packing house pig, it has no squeal to be lost."

His list included fresh fruit and juice, canned fruit and juice, frozen and powdered concentrate, beverage bases, alcohol, syrup, citrus molasses, marmalade, candied peel, pectin, turpeneless oil, naringin, vitamins C and P, dried citrus pulp, pressed cake, seed soil, seed meal, and methane gas.

Governor Fuller Warren recently designated Florida orange juice as the "State drink" of Florida. He serves it to callers at his office and at the Governor's mansion in Tallahassee.—*Clyde Beale, Agr'l Ext. Service, Gainesville.*

WEST VIRGINIA—For the last two years the seven-member West Virginia State Apple Commission has been administering the one-cent a bushel apple tax law enacted by the West Virginia Legislature in 1947.

On March 15, 1949, this law was declared unconstitutional by the State Supreme Court, for the reason that it imposed a discriminatory tax on private enterprise not in the public interest. In other words, apple growing, according to the ruling of the court, was not a sufficiently major activity in the State to be classified as a matter of public interest.

The validity of the law was challenged by a group of 30 growers in 1948.

VIRGINIA—An experimental frost warning service for the Virginia-West Virginia apple belt was started on March 15 by the U. S. Weather Bureau in co-operation with growers' associations in the two States.

Detailed weather forecasts are broadcast by regional radio stations in ample time for growers to prepare for protecting their orchards in the event damaging temperatures are expected during the night.

If this year's program proves valuable, a more detailed and extensive project will be considered for the future.

While vacationing in Florida, Garland J. Hopkins, prominent fruit grower of

FROST-DAMAGED GRAPEFRUIT

Courtesy Rio Grande Valley Exp. Sta.

Grapefruit demand for the next few seasons may be greater than the supply due to the severe freeze damage to Texas citrus on January 30-31. A Citrus Committee has investigated the damage and has made recommendations for handling injured fruit and trees. Another survey to determine full extent of injury is planned.

Troutville, was stricken and died. He had been a member of the Virginia State Horticultural Society since 1916.—*John F. Watson, Sec'y, Staunton.*

OREGON—One of Oregon's finest native fruit plants, the Pacific or Western plum, is being tested as a possible orchard variety in certain sections of the State by the Oregon Experiment Station. A. N. Roberts, assistant horticulturist, is project leader, assisted by Lew Hammers, graduate student in horticulture.

Growing wild in Lake and Klamath counties, the wild plum is a hardy variety, a prolific bearer, and a late bloomer. It produces a fine tart preserve, similar in some respects to cranberry sauce, which goes well with meat dishes.

The plum propagates easily on peach rootstocks, and other stocks show promise.

NAI MEETING

The 1949 annual meeting of the National Apple Institute will be held on June 16, 17, and 18, at Michigan State College, East Lansing. Program outline will be ready for announcement in the May issue.

Pollination studies indicate that it is self-sterile and will require cross-pollination. —*Sam H. Bailey, Ore. Exp. Sta. Inf. Spec., Corvallis.*

WISCONSIN—The Board of Directors of the Wisconsin Apple Institute voted at their annual meeting in March to postpone action on legislation to impose an excise tax on apples in order to raise money for more apple promotion.

The action was taken due to grower opposition which developed since the annual convention last November. At that time growers present voted almost unanimously in favor of such legislation.

The writer spoke at seven meetings of fruit growers' organizations in the State in late February and early March and explained the details of such a bill. Voting on ballots passed around to growers of more than 300 bushels of apples was about 2 to 1 in favor of the law. However, it was felt that only by united action could a bill be passed. Growers expressed themselves highly in favor of the work of the Wisconsin Apple Institute and the need for more apple promotion.—*H. J. Rahmlow, Sec'y, Madison.*

MINNESOTA—All fruits appear to have come through the winter in very good condition, due to cool, dry weather last fall that ripened the wood well and to favorable weather since last fall which kept the plants dormant.

A number of changes have been made in the recommended spray program, bringing it up-to-date with the latest knowledge of pest control. Growers should write to University Farm, St. Paul, for a copy of the 1949 spray program before starting the new season.—*J. D. Winter, Sec'y, Mound.*

CALIFORNIA—Citrus products had their spring "fashion" show March 10-20 at the 34th annual national orange show, staged in the orange empire city of San Bernardino, located in the heart of the California citrus country. San Bernardino lies in a scenic area below mile-high mountains, which in contrast to the sunny citrus groves, are capped with snow.

The show theme this year was "California Famous Days," in keeping with the Golden State's celebration of the '49

(*Continued on page 20*)

The Sprayer That Marks a NEW ERA In Pest Control

A still lower figure in the cost of fruit production is now made possible by the new Hardie Orchard Mist Air-type Sprayer. It cuts cost as compared with conventional high pressure spraying in 5 specific ways, as follows. Now you need only:

- **1 man instead of 6**
- **1 tractor instead of 2**
- **1 gallon of water instead of 8**
- **3 pounds of spray material instead of 4**
- **1 day instead of 2.**

Here is still another saving. In the purchase of this sprayer, the grower is not required to speculate on either the type of the sprayer or the method of application, for the Hardie Orchard Mist Sprayer will handle both the old standard insecticides and fungicides and the new more powerful materials. Controls are provided which make it possible to spray successfully with and against the wind and in the rain. Pump and tank capacity are adequate for spraying dilute mixtures with hose and guns when desired. Hose outlets for such purpose are built into the sprayer.

Get the facts about this most talked about new sprayer of today. Write for special Orchard Mist Sprayer folder just off the press. For high pressure sprayers in many sizes and models for orchard, weed, cattle and general spraying, write for the big 1949 Hardie Catalog.

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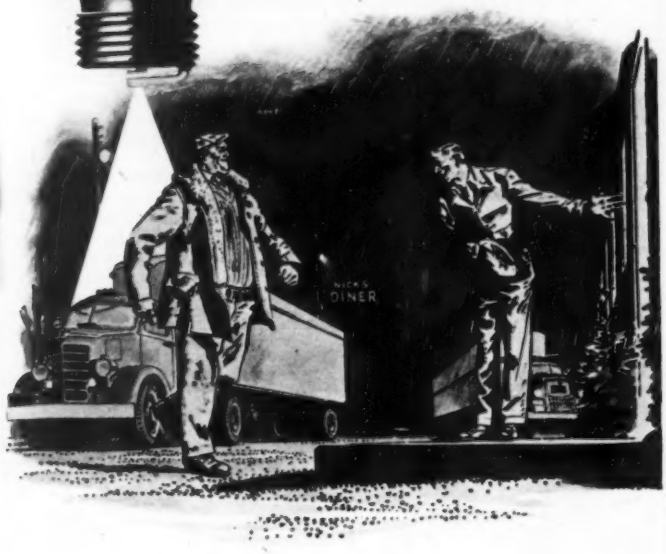
A vast portion of the rural districts, farms and small towns in this nation, are *entirely dependent* upon buses, cars and trucks for the movement of people and goods to and from marketing centers. Here is where dependable service in all kinds of weather, and over all kinds of roads is the measure of such vital equipment as spark plugs. Truck drivers, for example, whose opinions on spark plugs can be highly regarded, prefer and use Champion Spark Plugs in vast majority because they represent the ultimate in quality, value, performance and dependability. Champion Spark Plug Company, Toledo 1, Ohio.



FOLLOW THE EXPERTS

DEMAND DEPENDABLE CHAMPIONS FOR EVERY FARM ENGINE

Listen to CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over ABC network

STATE NEWS

(*Continued from page* 19)

Gold Rush. Citrus growers and marketing associations each year join in presenting exhibitions at the show.

Prominent Watsonville nurseryman, Henry Alton Hyde, 78, died recently of a heart attack. A native of Maine, Mr. Hyde had lived in California for 71 years and in Watsonville for 51 years. Mr. Hyde and the late O. O. Eaton shipped the first carload of strawberries east from the Oak Grove Berry Farm near Salinas.

NEW JERSEY—One of the oldest active members of the New Jersey State Horticultural Society, James C. Hendrickson of Middletown, recently passed away. He had been active in the society for over 40 years, serving as president for two years, as vice-president for the same number of years, and he was a member of the executive committee for several years. The last meeting he attended was in December, 1948.—*Arthur J. Farley, Sec'y, New Brunswick.*

IDAHO—An estimated 500 people attended the sessions of the 54th annual convention of the Idaho Horticultural Society recently held in Boise.

Lawrence Limbaugh, Fruitland, president of the society, keynoted his address with an appeal to raise the quality of Idaho prunes and make the package more attractive. The Prune Advertising Law, passed by a majority of the prune growers at a recent meeting, is now before the Legislature.

Timely subjects discussed included disease control, how to grow fruit for the cannery, apple quality and price, new mite sprays with special emphasis on Parathion, outlook for 1949, the "little cherry" problem, and orchard soil management.

The "Commercial Hour" was a new feature which gave spray material manufacturers an opportunity to discuss their products.

Roger Minster, Nampa, was elected president of the society for the ensuing year and Wayne Harper, Emmett, vice-president.—*Anton "Tony" Horn, Sec'y, Boise.*

DELAWARE—The Delaware Apple Growers Association, inactive since 1916, was reactivated on January 28, 1949. Officers for 1949 are: President, William H. Richter, Dover; vice-president, Kent County, Ralph Wine, Woodside; vice-president, Sussex County, Robert Smith, Bridgeville; and secretary-treasurer, Frank Richardson, Rising Sun.

The purpose of the association is to promote the sale of apples. The organization is currently sponsoring a bill in the Delaware Legislature for levying a tax on apple production, the tax money to be used for apple promotion. The bill has already passed the House and is being considered by the Senate.—*Robert F. Stevens, Sec'y, Newark.*

KENTUCKY—Predictions: That 1949 will be a good year to plant an acre or more of strawberries; that strawberry prices will continue good for a few years; that the Kentucky acreage of Tennessee Shipper and Tennessee Beauty will gradually increase; that berry growers who apply 1000 to 1500 pounds of superphosphate per acre will make 400 per cent on their money; and that strawberries will continue to "pay off" as well as or better than burley tobacco.—*W. W. Magill, Sec'y, Lexington.*

Black Leaf 40

MOST VERSATILE INSECTICIDE

Experience has taught our family and neighbors that **BLACK LEAF 40** *has a special place in our spray program*

4823

BLACK LEAF 40 OFFERS DECIDED ADVANTAGES:

IT IS DOUBLE-ACTING — When used as directed it *KILLS BY CONTACT AND BY FUMES.*

IT IS HARMLESS TO MANY BENEFICIAL INSECTS — It keeps the ladybird beetles, aphid lions, orius beetles and other friendly insects fighting on your side — killing aphids, leafhoppers and similar pests.

IT IS NON-CAUSTIC — Does not injure foliage or fruit.

IT LEAVES NO HARMFUL RESIDUE — Requires no washing of fruit or vegetables.

IT IS COMPATIBLE WITH OTHER STANDARD INSECTICIDES — Ideal for use in combination sprays.

BLACK LEAF 40 HAS ADDITIONAL USES ON THE FARM — It delouses poultry, when applied to roosts. It deworms sheep when used in cunic drenches. It kills certain external parasites on sheep and cattle when used as a dip.

MILLIONS OF USERS OF BLACK LEAF 40 MUST BE RIGHT — Nothing quite takes the place of this most versatile insecticide.

BLACK LEAF 155

— companion product to Black Leaf 40 — the standard "fixed" nicotine spray material. Black Leaf 155 meets the need for prolonged protection against codling moth, leafhoppers, citrus thrips and certain other pests, without undesirable residues. It acts as a stomach poison as well as a contact poison, destroying larvae as well as adults.

TOBACCO BY-PRODUCTS & CHEMICAL CORP.
RICHMOND, VIRGINIA

"Black Leaf"

ON THE PACKAGE

NU-Z
REQUIRES NO LIME
TC
TENNESSEE CORPORATION
NUTRITIONAL ZINC
SPRAY OR DUST

A NEW TC FUNGICIDE

NO LIME IS REQUIRED

A neutral zinc compound containing 55% zinc as metallic and is compatible with all organic insecticides. NU-Z is insoluble in water and will remain in suspension. Highly soluble in weak acids created by plants or fruit trees. As a neutral spray, can go into spray tanks WITHOUT LIME. Can be used as dust or spray.

WHEREVER ZINC IS REQUIRED, TRY NU-Z

TENNESSEE TRI-BASIC COPPER SULPHATE

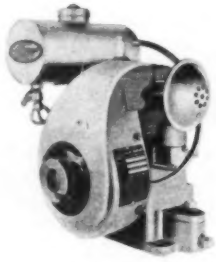
"MICROGEL"

DEMAND **that Tennessee Tri-Basic Copper Sulphate be used when buying copper dust or spray mixtures.**

TENNESSEE TC CORPORATION
Atlanta, Georgia — Lockland, Ohio

Now! **A New** *Lightweight*

LAUSON Engine!



- **Here's perfect portable power — a new lightweight Lauson engine weighing only 23 lbs!**
- **¾ H. P. — ideal for spraying, dusting and countless other operations. 4-Cycle, Air-Cooled. Other models to 5 H. P.**
- **Instant starting — economical operation.**
- **Machined mounting pad on crank case for direct mounting of pumps, generators, etc.**

NATION-WIDE LAUSON SERVICE AVAILABLE EVERYWHERE

Dept. AG, The LAUSON Company, New Holstein, Wis.

LAUSON

In Canada: Hart-Emerson Ltd. Winnipeg, Canada

ENGINE BUILDERS FOR OVER 50 YEARS!

MARK

PROCESSED FRUIT CONSUMPTION UP

● The year 1948 saw a decrease in consumption of fresh fruits of 12 pounds per capita, according to USDA figures. Most of the decrease occurred in peaches, of which there was a short crop, and in oranges.

Consumption of processed fruits continued to increase in 1948, confirming the rising demand for canned fruits which has raised total fruit consumption from a level of about 175 pounds per person in 1935 to about 215 pounds in 1948.

The increase in processed fruits consumption for 1948 over 1947 was mostly in canned citrus juices. Canned fruit consumption was about the same as in 1947, but decreases were registered for frozen fruits and dried fruits.

● **CANNED FRUITS**—The pack of canned fruits for the 1948-49 season was about 4 per cent below the previous year's pack but almost 50 per cent larger than the 1935-39 average. There were larger packs in 1948 of apricots, sweet and sour cherries, and fruit cocktail; but the packs of canned apples and sauce, peaches, and pears were smaller.

Producer and wholesaler distributor stocks of canned apples and sauce and sour cherries are reported moving well. Canners' stock of sweet cherries and apricots on February 1, as reported by the National Canners Association, were larger than a year ago. Packers' stocks of canned peaches and pears were larger than a year ago, and January 1 wholesaler supplies were down, indicating a tendency toward more hand-to-mouth buying by distributors.

● **FROZEN FRUITS**—For the first time in five years consumption of frozen fruits in 1948 did not increase over the previous year. 1948 per capita consumption was down 10 per cent from 1947's level.

According to USDA figures February 1 stocks of frozen fruits were about average. Movement out of cold storage for January was 18 million pounds—about 5 million pounds less than normal.

● **DRIED FRUITS**—The pack for the 1948-49 season was 23 per cent lower than in the preceding year, but supplies are still apparently in excess of demand. Pre-war exports amount-

ETING

ed to over one-third of the crop, and, with the loss of foreign markets, the dried fruit industry has a difficult surplus problem.

According to the USDA, to help relieve the industry, 274,000 tons of dried fruits were purchased by the CCC, mostly from the 1947-48 pack, and distributed through export channels and to institutions and the School Lunch program. Between October, 1948, and late January, 1949, 86,000 tons of prunes and raisins were purchased by the CCC from the 1948-49 pack.

● **CANNED FRUIT JUICES**—The 1948-49 commercial pack is apparently running behind the record 1947-48 production of 2½ million pounds, about 5/6 of which was citrus juice. 1948's large per capita consumption of 17.8 pounds, more than a pound larger than in 1947, was in part influenced by extremely low prices for canned orange, grapefruit, and blended citrus juices plus increased consumer acceptance of canned citrus juices. In 1947-48, for the first time in the history of the Florida orange industry, more oranges were canned than were sold fresh.

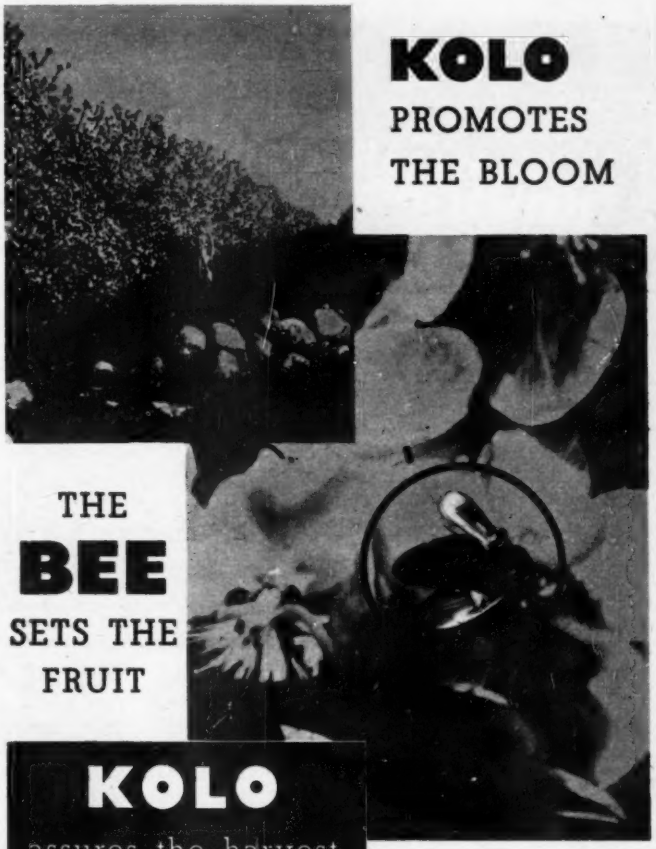
January 1 stocks of wholesale distributors showed only 189,000 cases of apple juice and sweet cider. Increasing competition may be expected from Hawaiian pineapple juice which showed 1.3 million cases in hands of wholesale distributors January 1—a 100 per cent increase over the previous year.

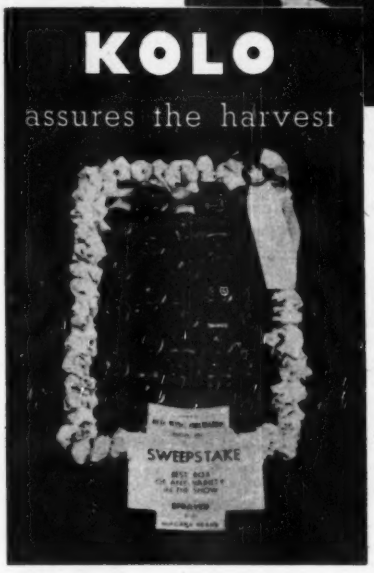
APPLE JUICER

● Appalachian Apple Service reports that more than eight years of effort in perfecting a fresh apple juicer for use at soda fountains, restaurants, etc., has finally borne fruit in a machine which has worked to satisfaction under commercial tests. Built by the Southern Cross Mfg. Co., of Washington, D.C., the machine has been received favorably by the trade.

It is expected that 100 glasses of juice will be obtained from one bushel of apples. At 10 cents a glass this will yield a generous profit to the retail juice seller.

Efforts are being made to keep the apple juicer under control of apple growers just as the juicer for oranges is controlled by the California Fruit Growers Exchange.





KOLOFOG,
KOLODUST,
KOLOSPRAY

give the kind of fungus protection that fruit trees like—mild, adhesive and highest scab prevention qualities. Kolo allows the trees to function normally producing clean fruit and healthy fruit buds.

Niagara

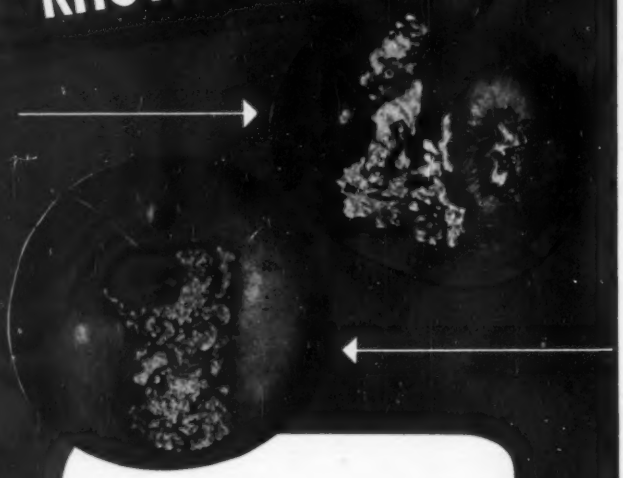
NIAGARA CHEMICAL DIVISION

FOOD MACHINERY AND CHEMICAL CORPORATION
Middleport, New York

Richmond, Calif. • Mt. Vernon, Wash. • New Orleans, La. • Greenville, Miss. Jacksonville, Fla. • Tampa, Fla. • Pompano, Fla. • Harlingen, Tex.
Canadian Associate: NIAGARA BRAND SPRAY CO., LTD., Burlington, Ontario

fmc

RHOTHANE stops this!



In the Shenandoah Valley, orchards protected by RHOTHANE yielded 85-100% clean fruit, while uncontrolled red-banded leaf rollers were causing 75% injured fruit in neighboring orchards. Experiment Station tests prove RHOTHANE gives almost perfect control (99%).

As a result, the Extension Service in Virginia, West Virginia, Maryland and New Jersey recommended RHOTHANE to orchardists. And in Western New York State, RHOTHANE (DDD) is included in the recommended orchard spray schedule.

One of the safest of the new insecticides, RHOTHANE is only 1/10 to 1/25th as toxic as DDT to man and other warm blooded animals.

RHOTHANE is a trade-mark, Reg. U. S. Pat. Off.

CHEMICALS FOR INDUSTRY

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

2,4-GEESE . . . BELIEVE IT OR NOT!

TWENTY YEARS before scientific men had developed 2,4-D as a weed killer, Kentucky growers in the Paducah area were controlling the dreaded weed, crabgrass, in their newly-set strawberry fields by forcing geese to pasture in the fields and extending the pasture period through August and September.

Just why a goose will eat tender crabgrass, saw briars, pursley, pig weeds, and, in fact, most any common weed pest in Kentucky, and yet will not eat the foliage of a strawberry plant, remains the $64.00 question.

A successful commercial grower recently stated that he considered eight geese on a two-acre patch of berries the equivalent of one man with a hoe working two-thirds of the time during the growing season.

A portable fence of two-inch mesh poultry wire, 30 inches high, stretched around the strawberry area and supported with stakes of about broom-handle size (or, in Kentucky language, using a tobacco stick with one end forced into the ground a foot deep) confines the geese to the field. This

Weeds + geese — labor = profit!

fence is usually placed at the time the berries are planted in March, and four or five geese per acre are put in the enclosure.

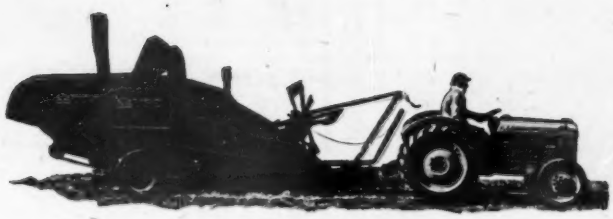
The geese prefer to do their feeding on the tender grass from late afternoon through the evening, and often during moonlight nights they will be found roving over the field in search of tender grass, especially crabgrass.

A simple range shelter about three feet high, consisting of four posts with crossbars for supporting a covering of straw or tree branches, is required to provide shade for the geese.

Then, too, an abundant supply of drinking water is necessary. This is usually provided by a 50-gallon oil drum equipped with a spigot that lets the water drip throughout the 24 hours into an open vessel. A subsistance ration of a small amount of shelled corn is usually furnished.—*W. W. Magill, Field Agent in Horticulture, Lexington, Ky.*

All these and many more engineered for the

Ford TRACTOR



Dearborn-Wood Bros. Combine

Dearborn Spring Tooth Harrow

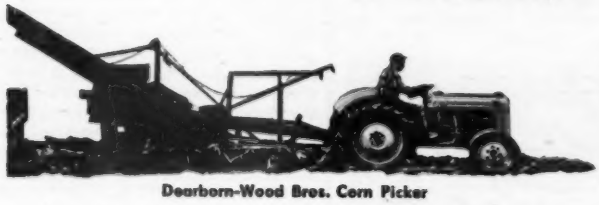
Dearborn Lift-Type Disc Harrow

Dearborn Scoop

Dearborn Tandem "B" Disc Harrow

Dearborn Disc Plow

Dearborn Heavy Duty Manure and Material Loader



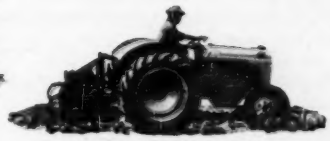
Dearborn-Wood Bros. Corn Picker

Dearborn Implements give farmers the rugged construction they like, plus the uncompromising quality that means long life and low lifetime cost. All but a very few can be attached or detached in three swift operations, saving precious working time in the field. Dearborn Implements are easy to transport, easy to use, easy to service, easy to store—and they do stand up.

And every Dearborn Implement is specifically engineered to work at its best with the Ford Tractor. Those illustrated and many more are available, helping to make the Ford Tractor a real "Year 'Round Tractor."

DEARBORN MOTORS CORPORATION, DETROIT 3, MICHIGAN

Dearborn FARM EQUIPMENT



Dearborn Spring Shank Cultivator

Look For This Sign . . .

It marks the headquarters of your nearby Ford Tractor dealer. He and his organization sell Ford Tractors and Dearborn Farm Equipment and offer you expert service and genuine parts.

The only time that Counts is Working Time

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Ford Farming MEANS LESS WORK . . . MORE INCOME PER ACRE

and the most thrifty

The most popular car in America!

Yes, that's it—the familiar freight car, which brings you most of the things you eat, wear, and use.

It does its vital job for you so thriftily that it carries freight for charges which average only about 1⅝ cents for moving a ton a mile—taking all kinds of freight over all distances.

When the war ended, these charges were no higher—and in many cases were lower—than when war began back in 1939. But prices and wages kept climbing until freight rates had to go up.

Railroad rates, though, went up *later* than other prices. By the time of the first small increase in freight rates, in the middle of 1946, the average level of other prices had already gone up more than 40 per cent above 1939.

And freight rates have gone up *less* than the average percentage increase of other prices—in fact, only about half as much.

So railroad freight charges now represent an even smaller fraction of the prices you pay for the things you buy than they did before the war.

Today, the railroad freight car is not only the most essential car in America—it is also the car that provides the world's thriftiest transportation.

ASSOCIATION OF AMERICAN RAILROADS
WASHINGTON 6, D. C.

Listen to THE RAILROAD HOUR

presenting the world's great musical shows. Every Monday evening over the ABC Network, 8-8:45 Eastern, Mountain, and Pacific Time; 7-7:45 Central Time.

APS

JOHN A. WARDER

By C. W. ELLENWOOD

Ohio Agricultural Experiment Station

DR. JOHN A. WARDER was one of the outstanding horticulturists of the 19th century. He was for many years a dominant influence in the American Pomological Society, and readers of AMERICAN FRUIT GROWER may be interested in a brief sketch about this man.

Dr. Warder was a medical doctor whose hobby was horticulture. He was born in Philadelphia in 1812 and died at North Bend, near Cincinnati, Ohio, July 14, 1883. From 1837 to 1855 he practiced medicine in Cincinnati and was associated with the best medical societies of his day. He also was connected with many scientific associations. In 1855 he gave up his medical practice and bought a part of the farm originally owned by President William Henry Harrison near North Bend, Ohio.

Like many doctors of his day, he had a natural interest in plants, and his interest extended far beyond a search for merely medicinal plants or herbs. Being a true horticulturist, he was keenly interested in plants and trees of all kinds.

Long before the advent of government supported experiment stations, Dr. Warder converted much of his large farm into a horticultural trial grounds. He tested hundreds of varieties of fruit as well as many ornamental plants.

But his interest in plant cultivation was secondary to his greatest horticultural contribution of promoting the organization of horticultural groups. He liked people and he liked associating with people interested in plants and nature generally. He was president of the Ohio Pomological Society from 1860 to 1867. The society then changed its name to The Ohio State Horticultural Society, and under the new name he was president until his death.

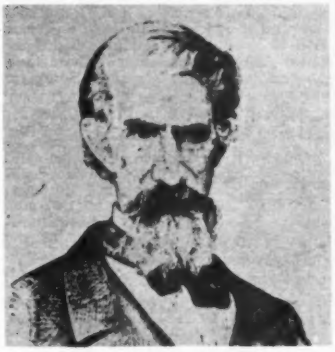
It was due largely to Dr. Warder's influence that the name was changed. The society, which is now 102 years old, had been organized in 1847 as the Ohio Pomological Society. Dr.

HISTORY OF HORTICULTURE

Warder felt that the interest of the membership should embrace a wider range of horticulture than pomology.

Dr. Warder was a member as well as vice-president of the American Pomological Society. He was the first president of the American Forestry Association. In fact, during the latter part of his life he was just as active in promoting an interest in forestry as in horticulture. He was one of the first to direct attention towards the beautification of parks and cemeteries.

Being a prolific writer, he used his pen to good effect and is best known, perhaps, for his contribution, "American Pomology," published in 1867.



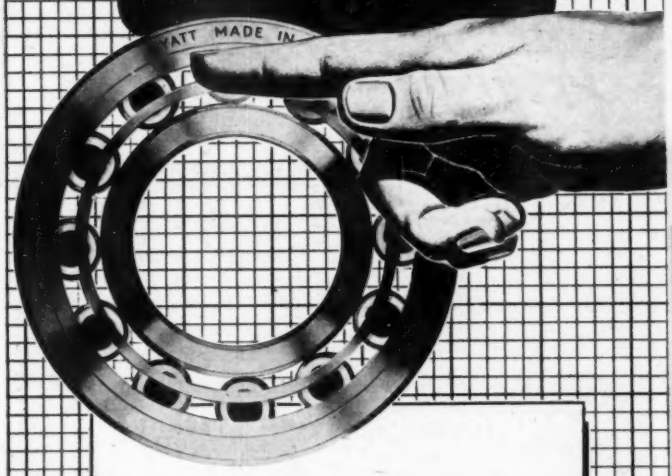
JOHN ASTON WARDER

This 744-page volume lists some 1500 varieties of apples, and in addition to variety descriptions it contains chapters on diseases, insects, propagation, storage, and many other phases of fruit growing.

Dr. Warder did not confine his horticultural writings to pomological questions. He wrote treatises and papers on many aspects of ornamental horticulture. Some 15 citations relating to his writings on forestry are on record. He was an accomplished, systematic botanist and wrote extensively on botanical subjects. In 1858 he described *Catalpa speciosa,* which since has been recognized as a distinct species.

Sixty-five years after his death it is difficult to appraise the real worth of his life and work. Certain it is that he was one of the horticultural "greats" of the 19th century.

BUILT FIRST . . . TO LAST



For nearly half a century, orchard and farm machinery manufacturers have looked to Hyatt for roller bearings in sizes and types to meet every application and position.

Down through the years, progressive design engineers in this field have selected Hyatt Roller Bearings for high quality and dependable performance.

In tractors, trucks, spray pumps and other equipment, leading manufacturers use Hyatt Roller Bearings to give you the utmost in care-free, longer service from your investment. Look for "Hyatt Roller Bearings" in the specifications. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

Here's the Stauffer line for a Balanced Spray and Dust Program in '49

MAGNETIC "70"

Concentrated Sulphur Paste

The cheapest, most effective protection you can buy for control of apple scab; blossom sprays for peach brown rot; and blossom sprays for cherry stem blight.

MAGNETIC "95"

Spraying Sulphur

A micro-fine dry-wettable sulphur for use on apple, peach and cherry — designed particularly for those who prefer a dry-wettable product.

MAGNETIC "90"

Dusting Sulphur

A micro-fine dusting sulphur — recommended for use during rains or as an in-between-dust in a spray program.

CROWN BRAND

Wettable Sulphur

A 325-mesh dry-wettable sulphur for use in pre-ripening sprays on peach, and in late cover sprays on apple.

341-C

Fungicide

A new protective fungicide for controlling apple scab. Field tests indicate that red mites do not build up on apple trees sprayed with 341-C.

THIOPHOS

Parathion

Stauffer's own wettable and dust concentrate formulations made from Thiophos Parathion. This new insecticide has shown remarkable control of a long list of insects on fruits, ornamentals and vegetable crops.

DDT

Stauffer's own 50% wettable and dust concentrates. Great favorites on the West Coast for several years — now available to growers everywhere for control of such pests as codling moth on apple, oriental fruit moth on peach, and leafhopper on grapes.

BHC

Stauffer's own BHC Wettable Concentrate contains 15% Gamma BHC and is specially formulated for use in water as an insecticide spray. Particularly recommended for the control of aphids on apple and plum curculio and tarnished plant bug on peach.

Stauffer CHEMICAL COMPANY

420 Lexington Avenue, New York 17, N. Y. • 221 North LaSalle Street, Chicago 1, Illinois
555 South Flower Street, Los Angeles 13, Cal. • 636 California Street, San Francisco 8, Cal.
Apopka, Fla. • N. Portland, Ore. • Houston 2, Tex. • Weslaco, Tex.

IN THE NEWS

M. J. DORSEY

M. J. Dorsey

At the annual meeting of the National Peach Council in February, Dr. M. J. Dorsey was named as the new secretary to succeed Carroll Miller, who will devote his time to the Appalachian Apple Service.

Dr. Dorsey, who was head of the department of horticulture at the University of Illinois College of Agriculture, retired on September 1 after 23 years of service to Illinois growers. He is continuing his writings on horticultural research and will complete reports of many experiments that were carried on under his guidance.

M. G. FARLEMAN

M. G. Farleman

The Standard Oil Co. (Ohio) has engaged M. G. Farleman as a full time consultant for Ohio fruit growers. A former professor of entomology at Michigan State College and with many years of experience in the field, he is an authority on insect and disease control. In his new capacity Mr. Farleman will be available to tell growers of the latest control measures and advise them how to improve or revise their present methods.

CHARLES P. ZORSCH

C. P. Zorsch

Charles P. Zorsch has joined the sales staff of Michigan Chemical Corp. and will manage sales of the corporation's agricultural line in several of the midwestern and central southern States. Mr. Zorsch was prominent in the early development of weed killing techniques and was active in the first experiments conducted with 2,4-D. He has his master's degree from Cornell University where he was associated with the New York Experiment Station.

JOHN F. WIDDER

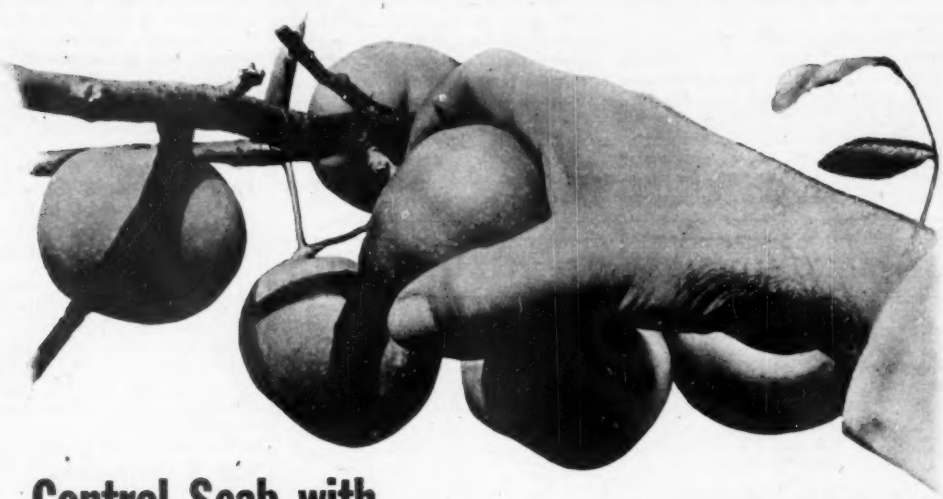
J. F. Widder

New sales manager of Bolens Products Div., Food Machinery & Chemical Corp., is John F. Widder, former assistant sales manager. Mr. Widder has been associated with the company in various sales capacities since postwar production began on the Bolens Huski line of garden tractors.

ROBERT M. PRATT

Expanding the use of spray concentrates for the Hardie Mfg. Co. will be the job of Robert M. Pratt, who has been appointed to lead laboratory and field studies in applying new types of sprays. As research assistant in plant pathology at Cornell University, Mr. Pratt has been active in developing the new Cornell type spray-duster which Hardie is now preparing to manufacture.

For Better Yield and Grade



Control Scab with

Du Pont FERMATE®

ORGANIC FUNGICIDE

"Fermate" provides more than scab control for your apple and pear crop . . . it usually leads to a bigger crop as well as a cleaner crop. And the trees protected with "Fermate" are more vigorous. Here are its outstanding features:

- **Effective scab control** used as dust or spray.
- **Greener foliage,** no stunting of leaves.
- **Compatible with** summer spray oils.
- **Safety from burning,** even in hot weather.
- **No russeting,** even with the tenderest varieties of pears or apples.
- **Higher yields** from more vigorous trees.
- **Better tree condition** . . . better bud formation for the next crop.

Controls other diseases: On apples and pears, the applications of "Fermate" for scab also control rust, bitter rot, black rot, leaf blight and apple blotch. "Fermate" is also outstanding for brown rot of stone fruits, for raspberry anthracnose, cranberry fruit rot and grape black rot.

▶**SEE YOUR DEALER** *for supplies now. Ask him for free Du Pont booklets, or write direct to Du Pont, Grasselli Chemicals Dept., Wilmington 98, Delaware.*

DU PONT CHEMICALS FOR THE FARM INCLUDE:

Fungicides—FERMATE®, ZERLATE®, Copper-A, Fixed Copper, SULFORON® and SULFORON®-X Wettable Sulfurs; *Insecticides*—DEENATE® DDT, MARLATE®, LEXONE® (Benzene Hexachloride), KRENITE® Dinitro Spray; Also AMMATE® and 2,4-D Weed Killers, Du Pont Spreader-Sticker, Spray Adhesive, FARMONE® Fruit Drop Inhibitor and many others.

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Du Pont Also Provides:

"DEENATE" DDT—Exceptional for codling moth and other insect pests of fruit.

"MARLATE" Insecticide—New, effective, unusually low toxicity. Especially for cherry fruit fly, fruit worm, insect pests of cranberries, stone fruits, grapes.

"ZERLATE" fungicide—Excellent for brown rot of stone fruits. Light-colored, does not show, yet protects fruit through shipping.

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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

SMALL FRUIT PROGRAM IN NEW JERSEY

(Continued from page 11)

The fruit of Redcrop is large, bright red, with a tendency toward darkening somewhat if left on the plants too long, and has a bright green calyx. It has been rated by the New Jersey Station and by members of the USDA as an excellent freezer. Under test the variety has done particularly well in south Jersey.

Approximately 30,000 plants of the Redcrop variety were purchased from the Small Fruits Industry Committee last year for test plantings by various growers throughout the State. Since the variety was named by the committee during the State horticultural society meetings at Atlantic City in December, 1948, the plants will be available to persons outside the State through the committee whose headquarters are at Steelman Nursery, Princeton, N.J.

Small Fruits Committee

The New Jersey Small Fruits Industry Committee was organized in 1933 as a part of the New Jersey State Horticultural Society. The committee consists of nine grower members appointed by the president of the society. It has many times demonstrated its ability to be of service by acting on such problems as selection and distribution of varieties, price control, testing of small fruit varieties, the virus situation in strawberries in New Jersey, etc.

New small fruit varieties introduced by the Station are propagated and sold through this committee. Any profit resulting from the sale of plants is used by the New Jersey Experiment Station to reinforce research work in small fruits.

Blueberry Breeding and Culture

Much of the pioneer work in the establishment of the cultivated blueberry has been done in New Jersey through the efforts of Miss Elizabeth White, Whitesbog, N.J.; the late Dr. F. V. Coville, USDA; Dr. J. H. Clarke, formerly of the New Jersey Experiment Station; and Dr. George M. Darrow, USDA. This breeding work is being expanded in an effort to further the industry to an even greater extent in the State of New Jersey.

The major portion of the blueberry and cranberry research work is done at the Cranberry and Blueberry Research Laboratory, Pemberton, N.J., under the leadership of Charles Doehlert. Some of the projects underway at the Substation are stunt transmission, blueberry roguing, insect control, use of lime in blueberries, cover crops, and magnesium deficiency.

During 1929 a highbush blueberry planting was established on the horticultural farm on upland soil under mulch, to demonstrate that varieties can be grown successfully under this method of culture.

Raspberry Crown Borer

Two recent insect and disease control recommendations formulated at New Jersey are for the control of the raspberry crown borer on the Black Diamond blackberry and spur blight on the raspberry. Raspberry crown borer on the blackberry has been commercially controlled by the use of DDT. Three sprays of a 50 per cent material at the rate of 1 pound per 100 gallons of water applied at 10 to 14-day intervals after the eggs hatch in the fall are recommended for the control of this insect.

Recommendations for the control of raspberry spur blight include a dormant spray of Dinitro, 1 gallon per 100 gallons of water, and two

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How to lick a phantom

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CHECK LIST OF INSULATION PROPERTIES

	Novoid Cork Insulation	Many Other Insulations
First cost	moderate	low to high
Installation cost	low	moderate to expensive
Eventual cost	low	high
Efficiency	remains high	generally deteriorates
Moisture resistance	excellent	some good, some poor
Vapor seal	simple	complicated or difficult to install
Structural strength	very good	some non-existent, others fair
Weight	very light	varies
Resilience	considerable	from fair to complete rigidity
Settling	none	a serious problem
Supporting structure	none	elaborate
Fire resistance	good	excellent to poor
Vermin resistance	good	excellent to very bad
Odor absorption	none	some are regular sponges

Consider EVERY factor when you buy insulation—and you'll buy NOVOID

ICE CREAM SALES INCREASED WITH FRUITS AND NUTS!

MERCHANDISING and promotion, both in general sales planning and at point-of-sale, have been the forces with which the industry has vastly increased ice cream consumption.

Merchandising and promotion have placed enormous emphasis on fruit and nut flavors in the serving of ice cream.

Thus, an even greater market for fruits and nuts has been created in this vast industry-wide program of expansion.

And, as this expansion continues in its long-range program, the ice cream industry as a market for fruits and nuts will continue to grow greater, season after season.

The knowledge of this planning and the successful accomplishment of its objectives are of very real value to fruit and nut growers, for on such a stable market their own expansion programs become less a gamble, more an investment.

The close alliance of fruits and nuts with ice cream will continue apace—providing a continuing market for both.

Yours for a greater market for fruits and nuts in the ice cream industry, International Association of Ice Cream Manufacturers, Barr Building, Washington, D.C. (Adv.)

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Literature on request

sprays of Fermate at the rate of 2 pounds per 100 gallons of water.

Beach Plum Investigations

Extensive areas of land in the Atlantic coastal plain region consist of soils too sandy for such fruits as apples and pears. Beach plums, however, will grow very well on these soils.

To improve this fruit, selections from the wild have been made. At the present time there are some selections which appear to have desirable characteristics but as yet none have been introduced. It is hoped that with at least one of the selections (N.J. No. 1), sufficient propagating wood can be obtained in the near future to introduce this variety along with a pollinizer.

Effect of Boron on Strawberries

The results of experiments with boron on strawberries indicated that the boron requirement of the Sparkle strawberry is very low, with .001 p.p.m. boron being sufficient to produce normal plants when the fruit was removed. However, when the plants were allowed to fruit, those receiving no boron and .001 p.p.m. boron produced only deformed fruits. Also, when the plants were fruited, the tips of the leaves were injured due to insufficient boron at these two levels. At boron concentrations of .05 and .25 p.p.m., the fruit was perfect. At 5 p.p.m., boron toxicity symptoms were quite severe.

Precooling Strawberries

In a preliminary study of precooling strawberries conducted during 1948, the following observations were made: (1) Berries kept at 70° F. showed considerable breakdown after a 25-hour exposure. (2) Short storage (two to three days) at 55° F. was best; there was very little sweating after removal from storage. (3) Temperatures lower than 55° F. for short storage periods were unnecessary. Also, the berries at the lower temperatures sweated considerably. However, berries stored for seven days at 30° F. showed very little ripening and practically no breakdown. These berries still made an attractive pack after being left at room temperature for six hours. (4) Berries stored at 55° F. for six hours and then exposed to room temperature for 18 hours still made a good retail pack. The six-hour storage period in the experiment would approximate the length of storage time from picking until the fruit is shipped, whereas the 18-hour period would also include the time that the berries are in the warehouse and in the retail store.

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MICRONIZED SULFURS
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3% DDT DUST

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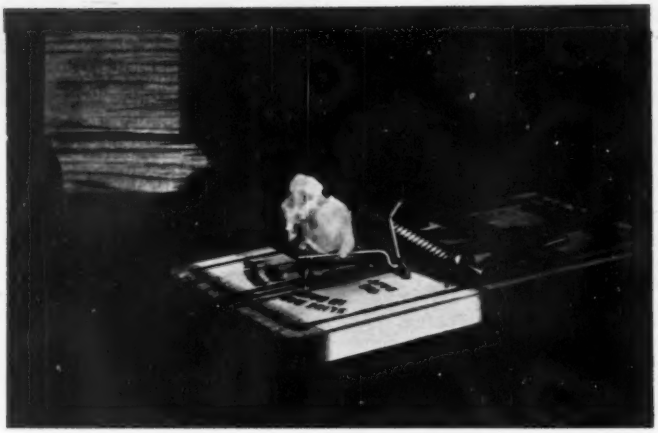

FOR UNWANTED VISITORS

When you're pestered with mice in any building, yes, set a trap. In the right place at the right time, it will put a stop to their foraging.

Out in the apple and peach orchards, when Plum Curculio are the unwanted visitors, Gamtox or Isotox sprays sure keep them from spoiling your fruit.

These sprays are the right things. The first appearance of the pests, the right time.

...AND STILL THERE'S TIME FOR

TAG
FUNGICIDE No. 331

if apple scab is active in your orchard.

GAMTOX
WETTABLE

This ORTHO BHC insecticide is highly toxic to plum curculio on apples and peaches.

You have a technically trained man in your area, ready to help you. He has wide practical experience. He is your ORTHO Fieldman.

ISOTOX
WETTABLE

The active BHC ingredient in this spray is well isolated and very effective.

ORTHO

Neither leaf nor fruit development is affected by these sprays. Their application can be made when required with any other materials in your regular spray program, except lime sulfur.

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OKLAHOMA CITY, OKLAHOMA
ELIZABETH, NEW JERSEY
LYNDONVILLE, NEW YORK
ORLANDO, FLORIDA

PREPACKAGING

(*Continued from page* 17)

Third, prepackaging promotes "impulse buying" — purchases that the customer before he entered the store had not planned to make. Studies have shown that impulse buying is especially important in the sale of fresh fruits and vegetables.

More and more stores are converting from service by clerks to self-service. This trend is stimulated by high labor costs. But the retailer who still displays apples in bulk on his shelves and who expects the housewife to continue to buy such commodities in the same fashion as when a clerk was present to do a "selling" job, is probably responsible for some of the decline in rate of apple consumption.

Who is the salesman in the self-service store? The package is the salesman. The package itself, its design, its shape, its attractiveness, are all responsible for getting the housewife to make that first purchase.

Impulse buying is important, and fresh fruits and vegetables are in competition with one another. Many vegetables are being consumer-packaged and if consumption continues to increase, it is inevitable that consumption of some other food will decrease.

Prepackaging and proper merchandising of apples may help to meet this competition of other commodities. The natural, beautifully rich color and fresh appearance of apples should make it easy to develop a maximum amount of "impulse sales appeal."

Shippers and packers of apples have been slow to accept the importance of the trend toward self-service selling of fruits and to change their merchandising methods to meet this modern development. As a consequence, some retailers have been forced into packaging apples in containers which are frequently unattractive and offer little in the way of promoting impulse buying. The responsibility of discovering and introducing improved merchandising techniques is not entirely the burden of the retailer, but should be shared by growers and shippers of apples.

Outlet for Small-Size Fruit

Fourth, prepackaging offers possibilities for expanding markets for small-size fruit. Nature frequently is unkind to the producer and leaves him "holding the bag" of an unusually high proportion of small fruit. California orange growers and Washington apple growers experi-

(*Continued on page* 38)

for better control of more insects, use insecticides containing

Thiophos

REG. U. S. PAT. OFF.

PARATHION

developed by American Cyanamid Company

Commercial use of THIOPHOS insecticides on fruit in 1948 confirmed the outstanding results obtained experimentally in 1947. The following are among the more important destructive insects that are killed easily and economically with Wettable Powders and Dilute Dusts containing THIOPHOS Parathion:

APHIDS	ORIENTAL FRUIT MOTH
MITES	WOOLLY APPLE APHID
THRIPS	PLUM CURCULIO
BEETLES	PEAR PSYLLA
RED-BANDED LEAF ROLLER	MEALY BUGS
COTTONY-CUSHION SCALE	BUD MOTH

The companies whose trade names appear below supply insecticides made from THIOPHOS Parathion. Select one of these reliable manufacturers as your source of supply, and discuss with an accredited representative your particular problem. Do the same with Federal and State agricultural experts in your locality.

Geigy PARATHION — Geigy Company Inc., New York, N. Y.

CHIPMAN PARATHION — Chipman Chemical Co., Inc., Bound Brook, N. J.

PARADUST PARATHION — Stauffer Chemical Company, San Francisco, Calif.

PENPHOS PARATHION — Pennsylvania Salt Manufacturing Company, Philadelphia, Pa.

P.A.R. PARATHION — Sunland Industries, Inc., Fresno, Calif.

DOW PARATHION — The Dow Chemical Company, Midland, Michigan

APHAMITE PARATHION — The Sherwin-Williams Company, Cleveland 1, Ohio

GENITHION PARATHION — General Chemical Division, Allied Chemical & Dye Corporation, New York, N. Y.

Phos Kil PARATHION — Niagara Chemical Division, Food Machinery Corporation, Middleport, N. Y.

VAPOPHOS PARATHION — California Spray-Chemical Corporation, Richmond, Calif.

PARATHION INSECTICIDES — Tobacco By-Products & Chemical Corporation, Richmond, Va.

American Cyanamid Company

Year after year—more and more fruit growers are feeding with VIGORO!

HERE'S WHY . . .

Vigoro helps them grow more profitable crops of fruit. It brings complete satisfaction to those who use it regularly.

Vigoro is complete, scientifically balanced plant food . . . plant food backed by over a quarter of a century of laboratory research and countless tests under actual growing conditions.

Vigoro supplies the food elements fruit trees must have to grow bigger yields of firmer, tastier fruit . . . the kind that commands top prices.

We want you to know the difference Vigoro makes. Write for further information. Send your name and address to:

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Plant Food Division
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ORCHARD SOILS

(*Continued from page* 14)

Humus renewal in addition to the use of commercial fertilizers is important because of the value of humus for improving physical properties, particularly the structure of the soil. Structure has been designated the key to soil fertility. Adequate humus renewal helps soil aggregation and stabilizes granulation to prevent the soil from losing its structure and running together and cementing to such an extent that roots do not develop or function properly. Without an adequately functioning root system there can be neither satisfactory growth nor fruiting.

SUCCESSFUL ORCHARDS

Cover crops are fast replacing the disk in the orchards of F. M. and Wayne Stull in Yakima County, Washington. According to Wayne Stull this means 10 to 15 per cent larger crops and fruit of better size and quality. The cover crops—rye with some native grasses and clover (Ladino or Alsike)—loosen the soil so that it will better absorb the water, retain the moisture longer, and make a green manure crop for much-needed nitrogen. Cover crops may also stop or correct erosion and proper regulation can overcome deficiencies of iron and zinc. It has also been found that the more permanent cover crops of a sod nature will help in preventing preharvest drop.—*Richard C. Bell.*

Humus materials also support the living organisms of the soil which are important in improving both physical and chemical soil properties. Bacteria, fungi, and other organisms break down raw organic matter to produce humus and decompose the humus itself and in so doing liberate nutrients and produce solvents that dissolve the minerals of the soil to supply the plant with what it needs. Animal organisms including various insects, larvae of insects, and larger organisms such as the earthworm, channel the soil so that a good soil becomes a system of tunnels and micro-channels through which water and air circulate

Use a Selective Insecticide for bigger crop yields

Sure, you kill the harmful chewing insects with Alcoa Cryolite.

What's more, it is *selective*. Alcoa Cryolite helps save *beneficial* insects that destroy aphids, red mites and leaf rollers.

Use Alcoa Cryolite for both field and garden crops. Dusts and sprays freely. It is not acutely poisonous to humans.

Write for YOUR FREE COPY of the dusting and spraying chart today.

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No. 1080 Heavy Duty Rubber Surface Salt

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and into which roots penetrate to absorb both moisture and nutrients.

Moisture-Holding Capacity of Soil

Moisture in the deep soil would be useless to the plant unless roots penetrate and function deeply. The best soils can hold 2000 tons (480,000 gals.) of crop water per acre in 10 feet of root zone to carry a crop through drought periods successfully, whereas a shallow soil, or one with cemented structure, would so limit root development and functioning that fruit crops would suffer quickly in drought periods, even to the extent of dropping the fruit before maturity.

Droughts with high temperature and low humidity are especially severe on plants when the soil limits the root system. Dry air at 100° F. is capable of absorbing seven times as much water as air at 40° F., and the pull upon the plant for water is correspondingly increased. Under such conditions the foliage may withdraw water from the fruit and in extreme cases the leaves may be dropped. Without leaves there cannot be a good harvest even if the fruit should hang on.

Growth Stimulants

Adequate humus renewal not only improves soil structure to the benefit of the plant, but the presence of rotting organic matter stimulates root development perhaps by supplying growth hormones, which are produced by the bacteria or other organisms causing the rotting of the organic matter.

It has been demonstrated that many soil organisms are capable of producing growth-stimulating hormones by decomposing organic matter and that these growth stimulants are present and extractable in good soils. It is also known that plants can absorb hormones from the soil.

Humus renewal as well as the use of suitable fertilizers on a well-chosen soil is, therefore, of paramount importance in fruit production. The grower must exercise vigilance to see that the system of culture is such as to maintain both the favorable physical and chemical properties that result in good growth and high production. With attention to these fundamentals, using fertilizers as needed, the way is prepared for satisfactory production over an extended period.

WEED SEEDS ARE TOUGH

Just another of nature's many quirks is the fact that she guards against the possible destruction of weeds by endowing the seeds with the ability to lie dormant for a number of years. In studies at Purdue University it was found that more than 15 per cent of seeds tested germinated after a 39-year period in the soil.

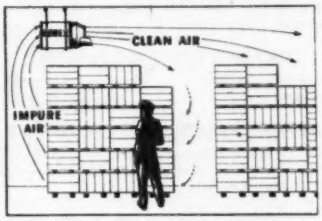
GREAT NEWS OUT OF APPLE STORAGE

GROWERS REPORT UP TO 8 WEEKS MORE STORAGE LIFE

SCALD REDUCED
FLAVOR PROTECTED

APPLES FIRMER LONGER MARKETS, PRICES BETTER

DOREX ACTIVATED CARBON UNITS MAY PAY FOR SELF IN 1ST YEAR



DOREX Apple Preservation Units were developed and tested with the various State College Agricultural Experiment Station Authorities. Used in commercial storage over three years. Simple. Self-contained. DOREX units circulate air twenty-four hours a day. Force it through powerful Activated Carbon.

Completely remove destructive "ripening" gases, "off" odors from all other materials, stored produce. Effect commercial control of scald.

Easy to install. Portable. Shipped complete; ready to mount or ceiling or wall. No extra parts. No costly ducts. Adjustable. Practically no attention required. Little space needed. Operation electric—entirely automatic. No connection with refrigeration. Annual cost: About one cent per bushel. Average first cost: About six cents per bushel. Any capacity provided.

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Reliable Control . . .

You can't do better!

HI-TEST LEAD ARSENATE
Greater safety and more killing power . . . assured by *unequaled* guaranteed chemical content

CHIPMAN DDT SPRAY POWDER
Contains 50% DDT. Used as water-suspension spray.

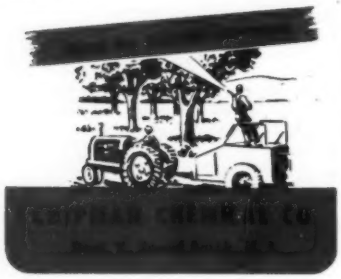
CHIPMAN PARATHION SPRAY POWDER
Highly toxic contact insecticide containing 15% Parathion. Controls aphids and mites on apples and pears.

BERAKO - Rotenone Spray
Contains 2½% pure rotenone with special wetting agent. Recommended for cherry fruit fly, green peach aphid, and certain other insects.

COPPER HYDRO
Neutral copper fungicide. Easy to mix . . . quick suspension. Does not clog. Compatible with most insecticides. Controls cherry leaf spot, apple scab, and many other fruit diseases.

CHIPMAN 2,4-D WEED KILLERS
Available as Amine liquid, Ester liquid and Sodium Salt spray powder.

ATLACIDE - Weed Killer
Kills all types of weeds and grasses. Destroys roots.



CHIPMAN CHEMICAL CO.

TAKING THE GUESSWORK OUT OF FRUIT SOILS

(*Continued from page* 13)

fruit enterprise. No amount of open ditch or tile drainage, subsoil plowing, or other practice can substantially change these soil properties. The physical and economic response to cultivation, fertilization, pruning, spraying, pollination, thinning, etc., on any particular block of fruit can be only within the limits permitted by the soil on which the trees are located.

The soil material in the western New York fruit belt was formed by prehistoric glacial action, some of which was modified by waters from the melting ice. This gave the fruit belt a wide variety of soils rather closely and intricately intermingled and many farms have areas of both good and poor fruit soils. Also, because of this glacial and water influence there is variation in soil texture and depth within each soil or soil group.

Science Plays Its Part

For purposes of analysis soil cores may be withdrawn from the soil with a California soil tube without disturbing the soil structures. From these soil cores a person trained to recognize soil characteristics can readily estimate the degree and extent of internal drainage, the depth of the surface soil, the location of subsoil, and the depth and permeability to water of the more compact subsoil layer ordinarily underlying nearly all western New York soils. By comparing these observations with similar information recorded as the average for the soil and soil group, it is possible to more definitely forecast the probable performance of fruit trees in the area from which the soil cores have been taken.

In locations where trees are now growing it is possible, with a Swedish increment borer, to extract long slen-

SPECIAL MENTION

Special mention should be made of the following men who have taken an active part in the gathering and assembling of the data on which this article is based. They are Joseph Oskamp (now retired) and Damon Boynton of the pomology department of New York State College of Agriculture; L. P. Batjer, now with the USDA at Wenatchee, Wash.; G. P. Scoville, T. E. Lamont, and Herrell DeGraff of the department of agricultural economics of New York State College of Agriculture; and A. T. Sweet (now retired), formerly with the USDA.

Don't Break Your Neck
Prevent Accidents! — Save a Life!
CUT LABOR COSTS UP TO 50%
DOUBLE PRODUCTION! **With the New, Amazing, Lightweight ALUMINUM Comb. Sawing, Pruning, Fruit Picking, Shaking Poles.**

ALUMINUM POLE — ⅓ weight of ordinary poles. 60c per ft. from 2 ft. to 60 ft. Lengths. Weighs 1 lb. per yd. Greater Strength. Lasts 10 time as long. No Breakage. No Splinters. Attachments extra. All prices F.O.B. Los Angeles.

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800 Lbs. Working Pressure
Each length equipped with High Pressure Couplings that will fit all makes of Pressure Sprayers.

I.D. Size & Length	Price Per Length
⅜" x 25 ft.	$ 4.75
⅜" x 50 ft.	8.50
½" x 25 ft.	6.00
½" x 50 ft.	11.00
¾" x 25 ft.	9.00
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Hose is light and flexible. Guaranteed.
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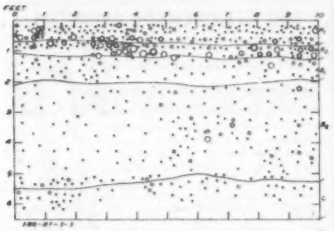
Spray guns of all types—30 years' experience

der cores of wood from the tree trunk or limbs. The rate of growth and the amount of live wood in these cores indicate the tree's ability to survive, grow, and produce fruit on the soil on which it stands.

This wealth of information takes much of the uncertainty out of evaluating fruit soils and makes possible the saving of untold thousands of dollars to individual fruit growers operating or planning to plant orchards in Monroe County. Such information is particularly useful in evaluating soils on which orchards have not been previously grown.

SOIL AND ROOT PROFILES ON WELL DRAINED AND POORLY DRAINED SOILS



Soil profiles are made by digging a trench under trees and mapping the roots cut off along the side of the trench. Above is a root map of a well-drained soil; below, a map of a poorly drained soil.

A great deal of progress has been made in evaluating fruit soils and growers are making more and more use of available information. It is well to know that some varieties of the various fruits and some strains of rootstocks are better able to tolerate less favorable soil conditions than others. However, too little is now known about this difference in fruit varieties and fruit rootstocks and the degree of tolerance which each possesses.

There is reason to believe that certain cultural practices, such as sod and sod mulch, hilling up the tree rows, open ditch and tile drains, may slightly lessen the impact of the less favorable soils. Little is positively known concerning the effect of the various cultural practices.

BIGGER CROPS—AND CLEANER FRUIT— MORE CASH FOR YOU

SHERWIN-WILLIAMS

DIMITE

GETS THE MITE —AND THE RED SPIDER TOO

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YOU add to the value of your crop the minute you start spraying with Dimite. You get cleaner fruit —you protect your grades—you get more cash. Dimite is powerful, sure and long-lasting—kills the newly-hatched nymphs before they can develop. One application is often enough for the whole growing season. It does *not* kill off the parasites of the red spider—and has proven exceptionally safe on the foliage of apples, pears and other trees. Spray with Dimite and protect your crop.

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One grower states: "We covered 45 acres of mature peach trees in less than 2 hours over soft ground following hard rains."

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Cuts 2" from ground, easily handles suckers or similar growths.

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SAVES YOU MONEY

SEE YOUR DEALER OR WRITE DPT. AFG-38

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PREPACKAGING

(*Continued from page 32*)

enced this phenomenon during the 1948 season.

Some housewives prefer a package of apples containing mixed sizes. Mothers of small children sometimes prefer small apples, so that a child won't throw away half of a large one. They are reluctant to give him the large one, and so he may be discouraged about eating any apples at all. Who can blame the housewife, pinched with high living costs, for being economical in her purchase and utilization of food?

Many a housewife might prefer buying various sizes of apples, otherwise of uniformly high quality, in the same package. While it may be true that large apples make a more attractive fruit bowl on the dining room table, small apples frequently provide a greater incentive to the economy-minded head of the house to pick up and eat an apple.

There are many indications that consumer packaging of mixed sizes of apples may tend to increase the consumption of this commodity and also promote more orderly marketing of the entire crop. Packaging of mixed sizes of apples also means less price discrimination against small apples, and a proper blending of sizes may increase gross returns to growers.

Not only may it prove profitable to blend sizes of apples in consumer packages, but it may be profitable to blend various color ranges of apples. Most produce merchandisers will agree, for example, that the majority of housewives prefer attractive all-deep-red Winesap apples to the less highly colored fruit. But would the average housewife be concerned to any great extent if she found a few less highly colored apples in the same package with more colorful ones? A scientific blending process at the packing house level might serve to increase the overall salability of the entire apple crop.

Identification Possible

Fifth, prepackaging of apples permits brand identification and informative labeling. Extension of brand identification of a commodity tends to raise merchandising standards. Not only would the individual packer benefit by marketing a higher quality product that would command greater trade and consumer preference, but the industry in general would benefit.

One of the most serious obstacles to attainment of maximum consumer acceptance of prepackaged apples is the occasional presence of inferior

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World's LOWEST PRICED *"Portable"* **POWER SPRAYER**

101 USES!

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- SPRAY gardens, lawns, trees, shrubs, livestock, buildings

USE ALSO AS A *"Portable"*

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This "Mighty Midget" of a sprayer shoots a driving stream up to 25 feet, or adjusts to a fine mist. Sprays a gallon-a-minute at pressures up to 150 lbs. Weighs only 75 lbs. Only 18 inches wide. Wheels like a baby carriage! Works like a charm!

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Measures up to 6" of rainfall with the Victor Rain-Gage. Simple, easily read. Rustproof . . . unbreakable. Designed by a meteorologist. Instructions and 11-year record book are included. . . . Your satisfaction guaranteed.

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quality apples in the package. The whole industry suffers when unscrupulous prepackers misrepresent their product by hiding low grade apples in the package.

On the other hand, the grower or shipper of high quality apples builds good will by printing on his package information for the consumer as to grade, variety, and suggestions or recipes as to special uses of his product.

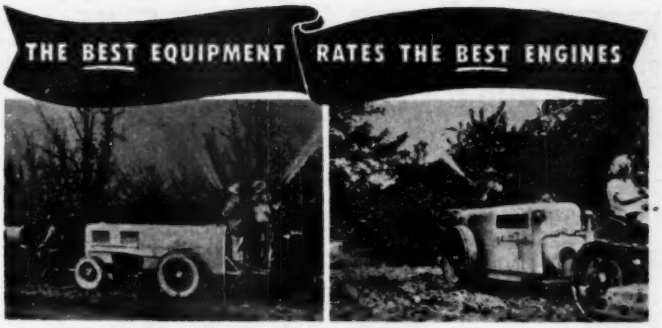
Sixth, prepackaging may eventually reduce marketing costs. Few people would dispute the contention that in the long run it may be more economical to prepackage apples in consumer units at the packing point level than it is for retail grocers to package by hand in various sized units at point of sale.

The conventional method of packing apples in standard boxes by individually wrapping them in paper, unwrapping them again at time of display in the store, arranging them in attractive pyramids or in jumbo displays and again picking them up individually and bagging them for Mrs. Housewife undoubtedly is a more costly and expensive process than prepackaging the apples for consumers in the packing plant.

Prepackaging Tests

The USDA has recognized the potential advantages of prepackaging apples and is co-operating with the Washington State apple industry in exploring ways of prepackaging Winesap apples at point of shipment. An arrangement has been made with the Washington State Apple Commission providing for experimental packaging and shipping of a number of carloads of prepackaged Winesap apples during the 1948-49 shipping season. Relatively small Winesap apples are being packed in various size combinations and varying proportions of less highly colored apples are being packed in different packages.

Tests are being carried out to discover what size as well as what type of package helps to sell the most apples. Questionnaire post cards are being placed in many of these consumer packages, inviting consumer comment. The replies will be tabulated and analyzed to provide information for developing improved methods of marketing apples. Appraisal of the economic feasibility of prepackaging apples at point of shipment will be made by comparing the costs of marketing prepackaged and bulk apples. Further research and industry experience are needed to solve the many important problems yet to be answered.



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You keep spraying and dusting schedules moving on time with equipment carrying such names as: John Bean, Buffalo Turbine, Evans Orchard Supply, A. B. Farquhar, Frost Insecticide, Hardie Mfg., F. E. Myers & Bro. Co.

All are sprayers and dusters powered by Wisconsin Heavy-Duty Air-Cooled Engines. All are built by manufacturers who know that *The Best Engines Make The Best Machines Better.*

Orchard equipment builders, along with hundreds of other manufacturers in almost every field in the 2 to 30 hp. range, rely on Wisconsin engines . . . first, because Wisconsins are built for year in and year out service . . . with "thrust-eliminating" Timken tapered roller bearings at both ends of the crankshaft . . . and a flywheel fan for trouble-free air-cooling at all seasons.

You are assured, too, of quickest starts and dependable ignition because of a "hot" magneto and impulse coupling, while a jet-and spray-oiling system eliminates grease and oil fittings . . . reduces maintenance.

Ask your orchard equipment dealer about Wisconsin-powered machinery and separate power units. Write us for information about all models . . . 4 cycle, single, two-, and four-cylinder types, 2 to 30 hp.

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World's Largest Builders of Heavy-Duty Air-Cooled Engines
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D-X is a powerful rotenone, piperonyl cyclonene and pyrethrum spray that is safe, effective and non-poisonous to man or warm-blooded animals. D-X kills more kinds of insects on fruits, vegetables and flowers. Many fruit growers use this powerful spray (1½ pints per hundred gallons) to increase the killing power of arsenate of lead and DDT sprays. Many home gardeners need nothing but D-X (2 teaspoonfuls per gallon water) for insects.

PRATT'S FRUIT TREE SPRAY—A powerful *insecticide* and *fungicide* which provides safe, effective control of insects and diseases on fruit trees. Use it as a spray or dust. Combines with D-X for an all-purpose spray.

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Send for free copy of "Spraying and Dusting in the Home Orchard and Garden."

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Solid brass pump with 27" long hose. Length overall 42".

This latest model Armstrong Spray Pump has many uses on farm, in garden or orchard—DDT to destroy bacteria, insects; chemicals for weed control; whitewash and cold water paints; sprays livestock, barns, lawns. Has enough force to reach the tallest trees. Nothing to get out of order, always ready for action. Just attach to any bucket or barrel.

ARMSTRONG SPRAYER with 5-gal. galvanized knapsack $13.50. Order today. Satisfaction guaranteed. Armstrong Products Corp., Dept. AG, Huntington 12, W. Va. Est. 1898.

SIMPLE LIFE

(*Continued from page* 15)

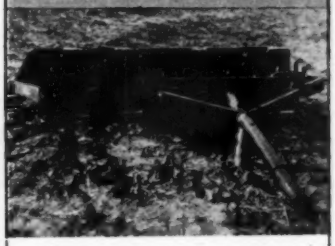
plus concentrated nitrogen fertilizers. This easy shot of stimulant appealed, also, to some whose trees were still living, the simple life of sod reinforced with mulch or manure. Nature's cycle was broken.

Today, McIntosh orchards are often producing greenish apples with dull-red cheeks; apples that lack full flavor. In wet years such fruits are too large; in dry years, too small. Red mites have increased with the use of DDT. Green aphids, leafhoppers, blight, and bark splitting are severe. Scab is epidemic.

For each new affliction, our scientists have evolved a remedy. With the use of each acclaimed remedy, a new problem has come to plague the distracted grower. Sessions at our fruit meetings are crowded with explanations of chemical formulas, with campaigns of strategy and with the choice of monstrous machines and perfected techniques whereby we may hope to blast our ever-increasing enemies. Our soils have become so unbalanced that intricate chemical analyses must be made to determine what we must use to restore balanced fertility. And the future promises no sure relief from this nightmare.

But here and there we find McIntosh trees living the simple life, producing beautiful, fine fruit. Their owners say that on such trees red mite is less severe, scab is not so difficult to control, there are fewer aphids and leafhoppers, there is no

HANDY ANDY



"This machine looks as if it will solve the cover crop problem," says Superintendent Fred Overley of the Tree Fruit Experiment Station in Washington. Now being built in Yakima, the Surface Crop Cutter rolls over the cover crop, flattens it, cuts it off into 14-inch lengths, and pushes it partly into the ground. The roots are not disturbed and the crop keeps growing. According to Overley cover crops help to build up the sub-soil in orchards and protect them from erosion, and the job will be made easier with the new Surface Crop Cutter. The cutter also has been used for shredding prunings in the orchard.

TOWER'S
'FISH BRAND' OILED SUITS and HATS
for spraying protection to outdoor workers

Roomy and of great durability these garments afford the unusual measure of comfort and protection particularly required by spraymen.

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Order at once. Stock limited. Trees will be shipped at planting season.

Complete line of other fruit trees . . . Apple, Pear, Plum, Prune, Cherry, etc. Also small fruits, Planters' grades at planters' prices. Write for prices or drop card for FREE copy of our catalog.

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EXTRA AT NO EXTRA COST! Automatic Agitator for use with wettable powders and emulsions.

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bark splitting, drouth and excessive wetness are less troublesome, tree growth is good, color and size of fruit are excellent, there is less premature fruit drop, there is no erosion, and the flavor is unexcelled.

What is this simple life of an apple tree? It is life in an orchard situated where climate is favorable; on a soil that once maintained a fine, virgin forest of the kinds of trees that require conditions best for apple trees.

The humus content found in a soil supporting a thrifty forest, a strong pasture, or a meadow is maintained or increased. The population of living things in the soil that are helpful to the natural processes of life and decay is fostered. The carpet of vegetation which covers the ground between the trees is left where it falls. A moderate depth of mulch is maintained by bringing in supplies to replace that which naturally disappears into the soil. The sod and mulch are occasionally supplemented with very moderate dressings of compost or of manure applied in the dormant season.

The choice of spray materials required to control diseases and insects, which are marring the fruit or injuring the trees because of immunity to natural controls, is made with care so as to preserve the efficiency of the foliage and to prevent upsetting the balance of life and decay in the soil. Pruning is done annually to remove drooping underneath wood which has borne, bent, and is shaded; also suckers, and upright shoots which will not bend with fruit but extend the tree above the desired height. The tree is thus kept open to allow air and sunlight to quickly dry the foliage and keep leaves and wood efficient and strong, while areas which may shelter insects are lessened. The fruit is all borne on strong wood in the light where color and quality are developed.

Natural Partnership

The simple life for a tree demands of the husbandman an appreciation of, and a respect for, all the conditions and associations of natural partnerships in the scheme of life with a gentle consideration of the needs and tendencies of the tree itself in shaping and keeping it within bounds.

The memories of the past, and the evidence of the present, both indicate that an understanding, sympathetic working with nature's laws and customs may make possible the simple life for our apple trees.

And so, when I look at these favored trees, memory carries me back. The picture becomes real and beautiful. A feeling of peace and hope and relaxation eases the strain of civilized living. Perhaps we, too, can enjoy something of the simple life of our orchards.

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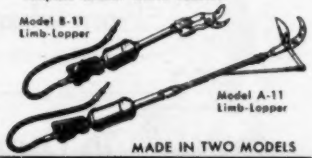
Growers report up to *six times* more pruning per man with the new air-operated Limb-Lopper—the pruning tool that cuts limbs up to 1¼" thick at the press of a trigger!

Made in models for all deciduous and citrus fruit trees, and for grape vines, berries, etc., the Limb-Lopper cuts pruning time 50% and more over tiresome manual operation of ordinary clippers. Small compressors provide air pressure for operating from 1 to 4 Limb-Loppers—ideal for large acreage where pruning is a costly problem.

Send for Bulletin B illustrating and describing the Limb-Lopper, and ask us for complete details. WRITE TODAY.



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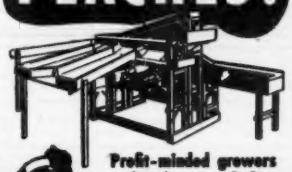

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From where I sit ... *by* Joe Marsh

To Dunk or Not To Dunk?

Dunking doughnuts is Sober Hopkins' favorite morning pastime ... and for a long time Ma Hopkins has been trying to break him of the habit. Feels it sets a bad example for the children.

So one morning she puts a heavy frosting of chocolate on the doughnuts ... figuring that will stop him. Sober thinks it over for a while and then: Dunk! Taste? Smile!! And Sober compliments the missus on the lovely mocha flavor!

I guess there'll always be two schools of thought: to dunk or not to dunk. But from where I sit, it's a matter of personal choice and taste—like some folks prefer beer to cider, ale to beer. And the less we criticize those differences of taste, the better.

In fact, Ma Hopkins got so curious about the flavor of chocolate-covered doughnuts dunked in coffee, that she tried it herself. Now—you've guessed it—she's a daily dunker, too!

Joe Marsh

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Give your youngster the joy-ride of a lifetime! TRACTALL looks just like a man-size Tractor. It's the perfect gift for boys, girls, up to 12 years old. Pedal-driven. Sold direct from factory. Write for Literature and FREE trial offer.
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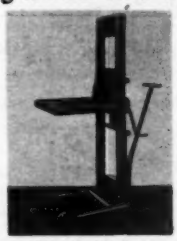
NEW FOR YOU

New Bes-Kil Blower

The Bes-Kil Aerosol Concentrate Sprayer has been doing a splendid job in orchards, and now with the new blower attachment with scientific nozzle arrangement thorough coverage is assured even on the highest trees. New equipment can be purchased with the blower included, or old Bes-Kils can be easily converted. Write the Besler Corp., Emeryville, Calif.

Lifting When You Want It



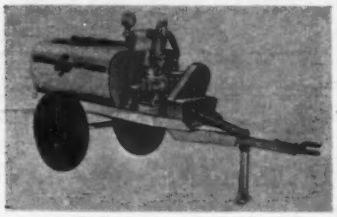
The new Handy Hoister raises and lowers loads up to 500 pounds. This strong, useful unit can be put to hundreds of uses in the storage or packing shed. Write Lewis Shepard Products Inc., 280 Walnut St., Watertown 72, Mass.

A Real Orchard Wagon

The new Cobey two-wheel tilting platform convertible body wagon is just what the grower has been waiting for. The platform, perfectly balanced and strongly made, is ideal for transporting fruit from the orchard to the packing shed or for taking prunings and brush to a central location for disposal. The Perfection Steel Body Co., Galion, Ohio, will give you further information.

- ORCHARD WAGON
- HANDY HOISTER
- CONCENTRATE SPRAYER

Spray the Myers Way



The new general purpose Myers spray rig, designed for any orchard or farm operation, is built for long service. Fruit growers will want more information on this rig which can be easily converted from one type to another. Write F. E. Myers & Bro. Co., Dept. AFG, Ashland, Ohio.

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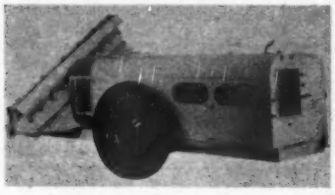
Concentrate Sprayer



In the March issue we may have mislead our readers by saying that the new Hardie Concentrate Sprayer uses seven-eighths of the water, five-sixths of the labor, etc. What we meant to get across was that this new rig *saves* seven-eighths of the water, five-sixths of the labor, half the tractor power, at least one-fourth of the spray materials, and more than half the time.

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THE FARMER'S PROFIT BOOK. PARTICULARS FREE. PUBLISHERS, 1931 E. 29 Street, Brooklyn, New York.

BOOKS: PRIVATE LIBRARY FOR SALE IN LOTS. Orchard, Farm, Garden and Nature Books. Send for lists. HUGH SMILEY, Henniker 16, New Hampshire.

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WRITE PAUL H. O'HARA, WINONA, NORFOLK, VA. for resolutions, diplomas, testimonials in Old English, German, Script. My clients include Admirals, Congressmen, Councilmen.

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WANTED, SMALL SECOND-HAND ELECTRIC APPLE press. Give particulars and price. FRANK RASMUSSEN, Richmond, Illinois.

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An advertisement of The B. F. Goodrich Company, Akron, Ohio

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by U. P. Hedrick

Not strictly an autobiography nor yet fiction this is the warm, delightfully told story of a boy's life and all the hardships and pleasures, people and adventures that composed it. At the same time it is the most complete description of hand laboring in agriculture that has yet appeared. Dr. Hedrick, from his earliest years, a lover of nature, is Emeritus Director of the New York State Agricultural Experiment Station and he has achieved a well-deserved reputation as one of the country's foremost authorities on horticulture. This book will remain long in your memory.

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BLUEBERRY PLANTS
Wholesale & Retail
15 VARIETIES
Order NOW for Fall or Spring Planting
MONROE FARMS
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Member of the Blueberry Cooperative Association

Dependable Fruit and Nut Trees, Small Fruits. Ornamentals, and General Nursery Stock. Write for Free Color Catalogue.
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NEW MINNESOTA APPLES: These Highly Recommended Varieties—Prairie Spy Minjon, #790 Oriole. Also Erickson Apple and N. Dak. Red River crab. Low prices and save 20%. Also Latham Raspberry. Buy Now. CATALOG IS FREE. GROWERS SINCE 1915.
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We offer only varieties that have been tested in our orchard. We practice bud selection for extra quality, color and vigor, which insures you the very best in variety characteristics. We specialize in Apple, Peach, Cherry, Plum.
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WHOLESALE AND RETAIL
One, two, and three years. Certified. Early, midseason and late varieties, bargain prices.
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VISIT THE HOLLENDEN... COMPLETELY REDECORATED!
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★ GARAGE ATTACHED
HOTEL HOLLENDEN
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Home of the famous Vogue Room

NEW BULLETINS

Many publications of the state agricultural colleges and experiment stations contain information of interest to fruit growers from other states. Frequently these bulletins may be obtained by writing the Director of Publications of the college or experiment station concerned. USDA bulletins may be obtained by writing the Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D. C. (They do not accept stamps as payment.)

- **Rodent Control in Orchards** (Circ. 321, 1948) Univ. of Mo., Columbia, outlines various methods for preventing rodent injury to fruit trees.
- **Planning for Fruit in the Home Garden** (Ext. Bul. 247, 1948) Rutgers Univ., New Brunswick, N.J., is a brief discussion of how, when, and where to plant fruits in a small garden.
- **The Peach Twig Borer** (Bul. 708, 1948) Calif. Agr. Exp. Station, Berkeley, describes the history and habits of the pest and recommends a control program based on experimental data.
- **Top Grafting Fruit Trees** (Stencil Circ. 62, Rev. 1947) Univ. of Wisc., Madison is a brief, well-illustrated description of top grafting.
- **Raspberry and Blackberry Culture** (Bul. 355, Rev. 1947) Vineland Hort. Exp. Station, Ontario, is a thorough discussion of berry culture from variety selection to harvesting.
- **Spraying Program and Pest Control for Fruit Crops** (Bul. 128, 12th Ed., 1949) Ohio State Univ., Columbus, gives the latest information on insecticides and fungicides and recommendations for their use.

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Since 1929 smooth in grafting and budding; cures tree and plant wounds, blights and other diseases and for cavities. Seals rodents, ants and other pests. Adhesive, waterproof. IT SEALS AND HEALS. SMEAR ON COLD. Put up in 1 lb. and 5 lb. cans. 80c per lb. (Postpaid) West of Mississippi River add 10c per lb. Free sample.
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Evergreen Lining-Out Stock
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2 YR. FIELD GROWN EVERBLOOMING
10 ROSES $1.89
BIGGEST ROSE BARGAIN
10 strong 2-yr heavy-rooted roses — collection includes assorted colors of brilliant REDS, PINKS, TWO-TONES, YELLOWS, ETC. SEND NO MONEY. We ship C.O.D. — pay postman just $1.89 plus postage. SATISFACTION GUARANTEED.
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CHOICE **FRUIT & NUT TREES**
FROM THIS FAMOUS NURSERY—SINCE 1915
NURSERY STOCK
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700 VARIETIES
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STRAWBERRY PLANTS
The two best everbearing varieties, New Twentieth Century and Superfection. 50—$3.50, 100—$6.00. Large, healthy, fresh dug plants.
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FRUIT TREE UNDERSTOCKS
For Grafting, Budding and Inarching
APPLES CHERRIES (Mahaleb)
PEARS (Bartlett) PLUMS (Native)
Write for complete price list
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Strawberry Plants Certified
Large crowns, Excellent roots, Moss packed, true to name. Blakemore, Klonmore, Klondyke, Postage paid. 100, $1.00; 250, $2.25; 500, $4.00. Express Collect, 1,000, $6.00; 5,000, $27.50; 10,000, $50.00. Tenn. Shipper, Tenn. Beauty, Premier. Postage paid, 100, $1.50; 250, $3.00; 500, $5.00. Express collect, $8.00 per 1,000.
ROMINES PLANT FARM, DAYTON, TENN.

ATTENTION CANADIANS!
Peach trees as low as 10c; Apple trees 15c and up. Write for Fruit Growers' Wholesale List.
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500 Varieties Grapes
Specializing in French Hybrids
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BLUEBERRY PLANTS
Specializing in Cultivated, Improved, Hybrids
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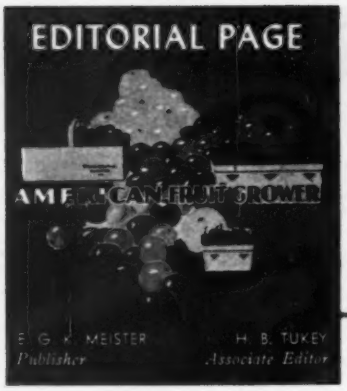

Relationship of Deer and Trees

WHEN HERDS of deer chew and damage orchard trees, a strong case can be made by the fruit grower for an open season on does and bucks or for reimbursement for damages through funds received from the sale of hunting licenses.

But an even stronger case can be made to hunters and wild-life conservationists for control of size of deer herds. A prominent conservationist has pointed out that deer multiply rapidly following the cutting of forests because the underbrush which springs up yields a plentiful supply of food. In any forest development trees follow the formation of brush, and in a severe winter the deer will destroy the young forest trees as well as orchard trees in the vicinity. Finally, after having destroyed their food supply, the quickly multiplying deer face slow death by starvation.

In the long run, the deer destroy the trees and finally themselves. On the other hand, by controlling the size of deer population, the trees are saved as well as the deer.

Even those sentimentalists who are dead set against open hunting seasons can understand that there is no worse death for deer than by slow starvation. It would seem that an appraisal of factors responsible for large deer populations and for the way deer herds come to an end would shift many a would-be wild life conservationist over to the side of the orchardist.

Nitrogen Shortage

ALTHOUGH many supplies which were formerly scarce and hard to locate are now readily available, such is not the case with nitrogen. It has been difficult to obtain nitrate fertilizer since the beginning of the war and today, nearly four years after the close of war, lack of nitrogen continues to threaten the productiveness of our orchards. The U. S. Department of Agriculture reports that supplies of nitrogen for the current fiscal year are expected to be 7 per cent above those of 1947-48, which would seem to present a more favorable picture. However, there is no avoiding the fact that nitrogen is unavailable to many growers who need it badly.

More than any other crop, orchards are dependent on nitrates for profitable production. As R. E. Stephenson points out in his excellent article on page 14, in fruit production, nitrogen is the nutrient element of first consideration. A factor easily overlooked by government planners is that fruit trees, unlike annual crops, may be permanently injured by a season or two of fertilizer shortage.

Nitrate fertilizer is of great importance especially when we are faced with an economic situation such as exists today. Lower unit costs are essential, and one way of cutting costs is by increasing the amount of fruit harvested per acre. A proper and judicious fertilizer program is one of the keys to increased production.

In the face of these conditions, fruit growers must not let up on their efforts to obtain adequate nitrogen supplies. At the same time, Federal authorities must understand the critical importance of nitrogen in fruit production and must bend all efforts towards making a greater supply available to fruit growers.

Fruit Production at a Glance

CITRUS

	1937-46	1947	Mar. 1, Est. 1948-49
	Thousand boxes		
Oranges, Total	89,727	110,384	98,430
California, all	48,902	45,700	33,900
Navels & Misc.	18,845	18,900	11,400
Valencias	30,056	26,800	22,500
Florida, all	36,490	58,400	61,000
Early & Midseason	20,005	31,000	32,000
Valencias	16,485	27,400	29,000
Other States	4,335	6,280	4,530
Tangerines	3,380	4,000	4,400
Grapefruit, Total	47,478	61,630	48,050
Florida	23,920	33,000	30,000
Texas	17,488	23,200	12,500
Other States	6,070	5,430	3,550
Lemons	12,808	12,870	8,900

Marketing Is More Than Economics

THE GREATEST DELUSION of the human race is the tendency to blame someone else for our own shortcomings. Therefore, when a newspaper columnist writes disparagingly about economists and says, "How do the professional economists keep up the dodge that they are scientists?" it is well first to look closer to home. The fault may be not so much with the economists as with those who place too much responsibility on the economists and expect too much of them.

There is danger of this situation in the new interest in marketing. The tendency among some self-appointed leaders is to draw a sharp line between production and marketing and to say that all problems beyond the orchard belong to the economists to solve. It is as though someone should arbitrarily say that all production problems belong to the spray experts. Surely spraying plays an important role in production, and economics an important part in marketing; but to give such inclusive responsibilities to either would be disastrous.

Are technical refrigeration problems for economics? Are storage diseases and disorders matters of economics? Are carbon dioxide treatments, ripening rooms, physiological changes within consumer packages, and related problems matters for economics alone?

Marketing begins with the selection of the variety and the site. It continues through pruning, pollination, insect and disease control, thinning, time and method of harvest, hauling, grading, packaging, transportation, refrigeration, canning, freezing, and on through retail channels to the consumer.

On the other hand, there are problems of production which are clearly matters of economics.

Economics has its place and has its contribution to make. To shift all the responsibility for marketing upon it is not fair to economics and will lead only to breakdown, disillusionment, and discrediting of an important and promising field.

Happily, there are leaders who sense this danger. "Marketing" cannot be arbitrarily compartmented. It is a moving belt from producer to consumer. All forces must be brought together and the producer and the production end must accept full responsibility along with economics.

Farmers take pride in Chevrolet's good looks that last through years of rugged use

Chevrolet's luxury look is as permanent as the car itself—and farmers know that Chevrolet gets the blue ribbons for durability! You can put this new Chevrolet through its paces every day of the week. You can work it on the farm from sunup to sundown. And no matter how rough you treat it, you'll be proud of your Chevrolet's modern beauty every time you go to town for years to come.

It takes a lot of car to satisfy a farmer—so, naturally, on the farm they agree Chevrolet is *the most beautiful* *BUY of all!*

The Fleetline De Luxe 4-Door Sedan

They like the way that Chevrolet's sturdy engine stands up to day-in, day-out driving on the farm

Handsome is as handsome does—and this strikingly handsome new Chevrolet turns in a powerful performance on even the most chewed-up back roads. Its rugged Valve-in-Head Thrift-Master engine purrs along without a pant over deep ruts . . . up steep grades . . . and even across fields!

CHEVROLET

Today's farmer demands a lot more from a car. He wants long-lasting good looks—the kind of durable beauty he gets from Chevrolet's years-ahead styling. He wants an engine that can stand up to the most rugged farm work—power such as Chevrolet's sturdy Valve-in-Head Thrift-Master engine delivers. He wants ease of handling and riding, *plus* economy in operation and upkeep. And today's farmer knows that he gets all these big-car features at lowest cost in the new Chevrolet *—the most beautiful BUY of all!*

CHEVROLET MOTOR DIVISION, *General Motors Corporation*, DETROIT 2, MICHIGAN

CHEVROLET

FIRST FOR QUALITY AT LOWEST COST

There's a lot to see in the country—and they see it all through Chevrolet's wide safety plate glass

Chevrolet's new all-round visibility adds an extra treat to your pleasure driving. A wider curved windshield, thinner windshield pillars and 30% more over-all window area are designed to make sure you see all and enjoy all. You ride in greater safety, too, because you get a more complete view from every angle, from every driving position.

Farmers do a lot of bulky buying in town—and they know Chevrolet's trunk space is plenty big to carry all their packages

You'll really appreciate your Chevrolet's generous trunk space every time you make a buying trip into town! You can load dozens of big bundles into it, and there's always room for more. It has the most convenient opening arrangement you've ever seen, too. Just turn the key and the trunk lid pops up. There's no handle to turn—nothing to fumble with!

Farmers are shrewd judges of values—and they find Chevrolet delivers the most car for their money in every way

Take a look at all the other great advantages that are yours at lowest cost in Chevrolet. Check the Unitized Knee-Action Ride, the direct-acting airplane type shock absorbers, extra-low-pressure tires, Certi-Safe Hydraulic Brakes, Center-Point Design. They all add up to greater value—the reason why farmers choose Chevrolet.

Scab is no problem here!

Profits grow on trees—for successful growers who have long depended on Dow for effective materials to fight apple scab and other enemies of top fruit production. Men who make the most of their orchard investments know that Dow insecticides and fungicides can be relied upon for protection of foliage and fruit from dormant season to harvest time.

"Mike" Sulfur—the ideal, noncaustic, wettable sulfur, more than 95% sulfur of microscopic fineness—has an important place in *your* spraying schedule. Many growers use it exclusively in combating apple scab and brown rot. Three pounds of lime per 100 gallons of water increase the efficiency of "Mike". Dow Dry Lime-Sulfur—preferred by many growers in pre-blossom sprays—dissolves readily in cold water, imparts superior finish to fruit.

NEW! Parathion—15% Wettable and Ferradow

Here are two new aids to the orchardist. PARATHION—15% wettable is a new powerful insecticide that shows good promise in control of mites, wooly aphid, mealy bugs and red-banded leaf roller. FERRADOW is Dow's newest organic fungicide that has proved itself in leading orchards as an effective control of scab, brown rot and other fungus diseases. Ask your dealer or write Dow for full information on these new aids to better fruit.

"Mike" Sulfur

and

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